The American Journal of Pharmaceutical .... Education ....

THE PROGRAM NUMBER
DENVER, COLORADO
August 16-17, 1942

THE OFFICIAL PUBLICATION OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

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Volume VI 1942 Number 3

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THE AMERICAN JOURNAL
— OF —
PHARMACEUTICAL EDUCATION

Volume VI ***July, 1942*** ***Number 3***

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Published quarterly by the American Association of Colleges of Pharmacy at Lincoln, Nebraska. (Claflin Printing Company.) Subscription price $2.00. Single copies 50 cents. Entered as second class matter July 1, 1937, at the postoffice at Lincoln, Nebraska, under the Act of August 24, 1912.

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Pharmacy: The Functional Significance of an Institutional Pattern*

ISADOR THORNER
Los Angeles, California

This paper attempts to demonstrate the relationship between an ethical code which has become institutionalized, that is, one which exercises moral constraint over the activities of the members of a profession and the function of that profession. The importance and validity of the institutionalized pattern as an explanatory principle will be indicated by the "meaningful" interpretation of certain otherwise unintelligible phenomena. The social role of the pharmacist and its implications for certain of his personality traits[1] will constitute part of the subject matter of this essay.

Pharmacy, however, is an occupation which presents a unique combination of professional and commercial elements. The very name, drugstore, is symbolic. Attention will be confined to pharmacy as it is practiced in the drugstore because it is there that the two elements are most intimately fused and where approximately 80 per cent of the graduates of pharmacy colleges are found. Moreover, it is this same character of the retail store as both a business and a profession which presents the pharmacist, his associations, and colleges with a series of problems; and provides sociology with a laboratory experiment in the relations of partially conflicting and congruent roles.

From the societal point of view, individuals are observed to be engaged in activities which result in (1) the preparation of drugs for use in ministering to health, and (2) their pro-

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*This paper appeared in Vol. 20, No. 3., page 321, March, 1942, of Social Forces, which is a standard publication for scientific sociological studies. It is edited by Dr. Howard W. Odum of the University of North Carolina in collaboration with a distinguished group of sociologists. The publisher is The Wilkins & Wilkins Company of Baltimore. The request for re-publication in this journal was graciously granted by permission of the publisher, the editor, and the author.—Editor.

[1] See Florian Znaniecki "Social Groups as Products of Participating Individuals," *American Journal of Sociology*, 44: 799-811 (May 1939) for a concise exposition of social role and its implications. The writer wishes to acknowledge his debt to Professor R. K. Merton, Columbia University, for critical reading of the manuscript.

vision when needed. These activities comprise the functions performed by persons in the occupation of pharmacy. The dichotomy of function relates to the fact that the preparation of drugs involves a skilled service while their distribution is chiefly a matter of the sale of commodities for profit. Specialized training in the acquisition of knowledge and skill is indicated in the former while no such formal preparation is necessary for the latter, although it possesses some commercial utility. Nevertheless, the distinction is valid; pharmacy colleges as professional schools are primarily engaged in teaching the principles of pharmacy, not salesmanship or store management.

Some conceptual clarification is necessary before proceeding further. The preparation and distribution of drugs may be conceived of as distinct occupations in the sense that each is analytically if not always concretely a relatively specific function necessary to society, with the practitioners being dependent upon the regular performance of their function for livelihood and status. Thus the pharmacist in a large store may do nothing but fill prescriptions and prepare ointments, elixirs, syrups, etc., while other employees sell the prescriptions and other items found in drugstores.

The difference between the two may be characterized, provisionally, in terms of what have been called the "enterprise" and the "profession." The former deals with commodities, success is aided by a lack of "traditional" ideas, and "practical" training may be useful. Should the latter, however, unfit an individual for other enterprises the occupation would approach the professional type which is entered by long training in ways usually established by the profession and sanctioned by the state. As a concomitant of this preparation requisite to the acquisition of the science and techniques there occurs an assimilation of a set of professional attitudes and controls, conscience and solidarity. "The profession aims and claims to become a moral unit."[2]

According to this view, conscience, solidarity, etc., mark the members of a profession whereas nothing of the sort would seem to attach to the participants in an enterprise. But the

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[2] E. C. Hughes, "Personality Types and Division of Labor," *American Journal of Sociology*, 33: 754-68. See also Znaniecki, op. cit.

latter as a system of relationships organized for a common end must necessarily possess a minimum of moral unity.[3] The real difference lies neither in the absence nor presence of moral ties[4] but their direction. In a profession, e. g., medicine, all or most of its members are united in a moral community of *physicians;* in an enterprise the members are united in a moral community embracing perhaps salespeople, advertising men, janitors, window dressers, executives, lawyers, and physicians. The profession is integrated "horizontally," including but one type of practitioner, the enterprise "vertically" with several. The profession is integrated about and oriented to a *general* goal, its function; the enterprise is concerned with the welfare of a *specific* organization. It follows that the professional man's responsibility and loyalty are primarily to the most effective performance of the function while those of the members of an enterprise are directed toward the organization.

It turns out therefore upon closer examination that the two concepts are not on the same conceptual level. The enterprise, strictly speaking, is not an occupation but a particular form of organization. Thus the American Pharmaceutical Association, a drug store, a hospital, and a department store may employ pharmacists, typists, plumbers, and representatives of other occupational categories. Organizations may be compared and analyzed and occupations also, but not the former with the latter.

Implicit in Hughes' description of the profession is the idea of long study in the acquisition of the relevant basic principles and skills. Furthermore, because the formal education and training are in the hands of members of the profession, its history, tradition, and approved mode of behavior are passed on to and acquired by those who aspire to enter its ranks. As a consequence of such ties among the members of a profession, it is not surprising that there arise associations whose primary aim is to guard the dignity and interests of the profession, to foster the advance of the knowledge, skill, and

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[3] See Chester I. Barnard, *The Functions of the Executive* (Cambridge: Harvard University Press, 1940).

[4] Or of traditional ideas. On this point see Talcott Parsons, "The Professions and Social Structure," *Social Forces*, 17: 457-67 (May 1939) where antitraditionalism is shown to be common to both business and the professions in modern Western civilization.

techniques peculiar to it, and to watch jealously over the competence and probity of its members.

Gathering these elements together we may list the essentials of the professional occupation as follows: (1) a relatively specific, socially necessary function upon the regular performance of which the practitioner depends for his livelihood and social status; (2) a special technique, competence in which is demanded, resting upon; (3) a body of knowledge embracing generalized principles the mastery of which requires theoretical study; (4) a traditional and generally accepted ethic subordinating its adherents' immediate private interests to the most effective performance of the function; and (5) a formal association fostering the ethic and improvement of performance.

The third criterion excludes skilled occupations which do not necessitate as indispensable a grasp of the sciences or other intellectual disciplines such as, for example, theology or jurisprudence. It may be remarked that this criterion differentiates between professional and nonprofessional medieval guilds from which, as one source, the modern profession derives its intellectual and ethical tradition. In order to avoid confusion on the fourth point we understand by this that in the long run it is to the professional man's private interest to conform to his professional code. His behavior in the type case is simultaneously "self-interested" and "disinterested." The contrast is not between business people who want to make money and professional people who do not, for both are equally interested in it as a generalized goal, but between two institutionalized patterns controlling the manner in which money ought to be made. "Ought to be made" refers to the fact that institutionalized norms rarely if ever achieve perfect conformance, but this does not mean that they are altogether without influence upon behavior.[5]

The mode of remuneration has not been mentioned. In general it is either on a salary or fee, fixed or sliding, basis. This of course is not peculiar to the professions and therefore it may be more convenient to note the manner of payment in a negative fashion: it is not made indirectly in the guise of a

[5] See Talcott Parsons, "The Motivation of Economic Activities," *Canadian Journal of Economics and Political Science*, 6: 187-202 (May 1940).

profit incident to a transaction involving material goods. The exceptions prove the rule, as optometry and pharmacy hover on the fringe of professionalism in comparison with medicine, law, teaching, the ministry, etc.[6]

Having distinguished between professional and nonprofessional occupations, it is clear that the preparation of drugs is a professional service; their distribution is not. The second function takes place most generally in the enterprise, which is understood to be an organization oriented to the increase of its financial resources in the market. The drug store is an organization of this type; the hospital frequently is not. We now turn to an examination of certain of the relations between professional function and institutionalized code.

In the broadest sense the function of pharmacy as a profession is the preparation of medicine for those who need it. In our society the decisions as to the need and what specific medicine answers the need are, aside from self-medication, the peculiar province of the physician. Pharmacy is an adjunct to medicine. Trespass upon the latter's domain is recognized and condemned by pharmacy's professional code. In the latest revision (1923), the druggist is cautioned not to substitute on a prescription, neither as to the substance called for nor the brand. The ingredients prescribed, their effect, and the doctor's intent are not to be questioned. The directions on the prescription are to be faithfully copied upon the label and instructions as to refilling, if any, are to be heeded. Neither additional directions nor poison labels are to be affixed to the container without the doctor's consent.[7] When there is doubt as to the directions, the physician is to be consulted in order to avoid error or an unpleasant situation.

But blind adherence to directions does not constitute the pharmacist's whole duty. The full responsibility is not the physician's alone. Doctors err, mistakes appear on prescriptions, and it is the pharmacist's business to detect them. His professional training includes a knowledge of pharmacy, chem-

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[6] On this point and the distinguishing features of the profession see A. M. Carr-Saunders and P. A. Wilson, *The Professions* (Oxford: Clarendon Press 1933), pp. 284-7.

[7] The functional significance of the last prohibition may be grasped and that the word, poison, has connotations which can be psychologically if it is understood that poisons are prescribed for their medicinal effect disturbing to patients.

istry, posology, toxicology, materia medica, and other subjects, so that he may recognize harmful substances resulting from compounding according to directions or overdoses in the amount of potent ingredients prescribed. Should he fail to do so, he as well as the doctor may be held responsible.[8]

The same responsibility extends to the use of dangerous drugs by the public. The professional code warns against the indiscriminate placing of powerful drugs or poisons in the layman's hands, for it is the profession's duty to safeguard the public from poisonous and habit-forming drugs. This has been expressed in statutes by setting up lists of drugs which may be sold only after certain precautions as to regulation and labeling have been taken. This same sense of responsibility manifests itself, for example, in the query as to the use for which borax is wanted when the pharmacist is doubtful as to the purchaser's intent. Borax instead of boric acid as an eye lotion may have serious consequences. While no *legal* penalties could result from such a mishap, the pharmacist might well feel morally responsible and experience the pangs of professional conscience.

There are other forms assumed by the responsibility attached to this profession's function. "The services the pharmacist renders are so important and the substances he handles so dangerous, that five traits of character and personality which should constantly control his actions are emphasized; namely, accuracy, honesty, dependability, professional technique, and cleanliness."[9] Professional technique is scarcely a trait of character and personality, but the general idea is clear enough. Unless such attitudes become ingrained, forgetfulness may lead to disastrous consequences.

Accuracy is called for because dosages involving 1/60th and 1/100th of a grain are not uncommon and a patient's phys-

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[8]The druggist's duty to a purchaser extends beyond dispensing what the prescription calls for since, as a chemist, he may know that the physician has erred and the prescription might cause death or injury. But, and this brings into relief the relation of responsibility, the pharmacist is not held liable for failure to inquire of the doctor who prescribes a poison where inquiry would have resulted in the physician's confirmation of his prescription. See William R. Arthur, *The Law of Drugs and Druggists* (St. Paul: West Publishing Co., 1940), pp. 51-4.

[9]Guidance Leaflet #14, "Pharmacy," (U. S. Department of the Interior, Office of Education. Reprint by the American Pharmaceutical Association: 1941 revision), p. 3.

ical condition may be such as to require neither more nor less than the prescribed amount. This need for accuracy is at the bottom of what may seem to be rituals performed by pharmacists. Before compounding a prescription, all the ingredients will usually be lined up on one side of the table and, as each is used, it will be transferred to the other. If another pharmacist is present, he will often check items and quantities against the prescription. If the pharmacist is alone, he will do so by memory as each substance is replaced upon the shelf. The ideal of accuracy is approximated most closely by those druggists who weigh each capsule or powder paper instead of trusting to long experience in getting a uniform quantity of medicine in each "by eye." Smelling the contents of bottles is another very common practice associated with accuracy. Likewise is the almost universal grouch against physicians for the illegibility of their prescriptions, although here there is an element of professional pride in ability at deciphering them.

Cleanliness is indicated by the possibility that traces of potent drugs remaining upon instruments will be transferred to medicines in which their effects may be disastrous. Moreover, unless care is used in keeping scales clean accuracy is impossible. The extent to which this cleanliness and accuracy can reach is illustrated by the pharmacist who, when weighing a gold locket and chain for a customer, automatically covered each scale pan with a powder paper, weighed them most meticulously, and destroyed both of the papers afterwards. This same individual with obvious pride demonstrated his technique of washing graduates and removing grease from mortars as part of his *professional* ability and obligation incident to compounding. The porter was not permitted to clean the professional instruments.

Thoroughness is a quality applicable not only to accuracy and cleanliness but also, for example, to the technique of manipulating a pestle in a mortar or a spatula on an ointment slab to produce a grit-free powder or a salve for application to sensitive areas.

Having suggested the congruence between the pharmacist's function, parts of his institutionalized code, and certain of his personality traits, it may be well to discuss at some length the validity of emphasizing the element of moral responsibility deriving from a code of ethics. Perhaps it is the

fear of legal penalties which is the real explanation of the pharmacist's care in dealing with drugs. It is undoubtedly true—in part—but a series of cases will be presented in an attempt to indicate the correctness of the position taken.

The pharmacy code specifies obedience to the laws regulating the sale of narcotics and alcoholic liquors.[10] The legal penalties and the intricacy of the methods of keeping track of the quantities purchased and sold were, if anything, more rigorous in the case of liquor. Yet, then as today, narcotic violations were practically nonexistent. How the liquor laws were "observed" is notorious. In view of the precautions which surrounded the purchase and vending of liquor and the ingenuity and bribery employed in evasion, it is clear that profits equally large and secure could have been and perhaps still are possible in the illicit sale of narcotics.

Since the forces of legal sanctions and profit incentives were about equal, neither the fear of punishment nor the hope of gain can be considered as satisfactory motivations explanatory of the differential in violations. The element of moral responsibility, however, brings into play a moral sanction sufficiently powerful to account for this difference. The function of pharmacy is to prepare medicines for use in caring for the health of the public. What constitutes health may be a matter of cultural definition. It so happens that drug addiction is defined in the United States in such a way as to classify the addict as a health problem of the most serious kind. (There are other elements, but they may be neglected here.) The alcoholic is also a medical case, but it is only the extreme and confirmed drunkard who is so classified, other degrees of indulgence are ignored and even admired as the capacity to hold one's liquor like a gentleman. Consumption of alcoholic beverages is in fact enjoined by the cultural pattern as the appropriate adjunct to numerous social ceremonies. In drug addiction there are *no* tolerated degrees—at least in the United States. The conclusion is that when the specific function of pharmacy as a *profession* is involved, a powerful moral obligation of conformance to its ethical code comes into play. In this case the conclusion is most strikingly displayed because adherence to *both* liquor and narcotic laws is demanded by the

[10] The code was adopted during the prohibition era in 1923.

formal code of ethics; only the latter, however, has been institutionalized.

A supplementary "experiment" will illustrate the operation of this principle in another situation. Bichloride of mercury, strychnine, and arsenic, when called for on prescriptions in quantities totaling perhaps not more than one grain, about 1/480th of an ounce, will be handled most gingerly and with scrupulous care. It is a prescription and as such comes within the health function. The same pharmacist, upon formal assurance that the purchaser is going to use these substances on *rodents* or as *insecticides* and is aware of their poisonous nature, will, after conforming to the legal requirements involved, sell relatively huge amounts (insofar as toxicity is concerned) of bichloride, strychnine, and arsenic without a qualm. They are destroyers of vermin and as such their sale is not connected with the public health (disregarding the question of sanitation for the moment). The transaction is not a professional service so much as the sale of a commodity at a profit similar to a hundred other routine commercial transactions in the drug store *enterprise*. If this sale is not altogether routine, it is precisely due to the possibility that the public health may be involved. To the extent that a sale is professionally neutral, the accepted attitudes and practices of the enterprise prevail. Two distinct roles are present; their conflict presents the pharmacist with a moral problem.

The influence of professional ethics upon the sale of a commodity unregulated by law is illustrated by hypnotics. Massachusetts at present permits barbituric acid derivatives and preparations, e. g., Veronal, Elixir Luminal, to be sold freely "over the counter." As an enterprise the drug store is interested in the maximization of money income, an ethical goal, obtained by selling as many items for as much profit as possible, an ethical means. A tube of Veronal tablets is, legally and commercially, in the same category as a tube of toothpaste or mucilage. Yet the manager of a busy Boston drug store refuses to sell Veronal and similar preparations too freely because he feels it is not ethical. What is meant is brought out by his remark that "People hear of them but are ignorant of their power and use." His policy "is not to sell these things, because the customer's health comes first, before profits. Pharmacists have a sixth sense on these things—when not to sell."

Obviously this "sixth sense" is related to a feeling of responsibility deriving from the pharmacist's professional function. In this as in many other instances the enterpriser's otherwise legitimate interests are overridden.

Several cases have been presented in confirmation of the effectiveness of professional responsibility as a controlling factor. Prior thereto we had been tracing the functional relation of the pharmacist's personality traits and his primary professional interest. Mention had been made of what had at least appeared to be ritualistic performances, although sound empirical reasons were shown to exist. But examining the problem more closely one may ask why, in a prescription calling for a dozen capsules so innocuous that ten times as many could be taken at a single dose, such extreme accuracy should be employed? Why should a completed prescription be discarded when a check discovers that instead of one ounce of Milk of Bismuth two had been used and instead, therefore, of two ounces of water only one had been employed? Why should a pharmacist spend perhaps half an hour on a prescription selling for a dollar while an impatient customer has left with what he fears may be several times that amount of business, to say nothing of the loss of good will?

In the last two of these three illustrations a direct financial loss is sustained, in the first two neither appearance, taste, nor results would be affected if the inaccuracies had been overlooked. No one would ever know the difference. However soundly based on "logico-experimental" reasoning the pharmacist's explanation may be with regard to dangerous materials, this does not apply to the kind of cases hypothesized. Rather than this sort of inadequate interpretation one must acknowledge that for the pharmacist accuracy is a norm which is adhered to for its own sake. It is an ethical criterion, universalistic in that all prescriptions filled for any individual at whatever price, or none, receive the same accurate treatment. Moreover, professional pride no less than conscience is involved. Further, should a pharmacist have ignored this "categorical imperative," its presence would yet be manifested in the form of guilt feelings.

Accuracy may be considered as an expression of honesty in this particular profession, and vice versa. In both, norms are at issue within a particular context. To illustrate: The

manager of a store cited a prescription brought in to him after six other places had been tried unsuccessfully. It called for Squibb's potassium permanganate tablets. None of them carried this brand, although they undoubtedly had others; nor did this store. The logical thing to have done would have been to phone the doctor, explain the situation, and receive permission to substitute the kind on hand without the patient knowing anything about it. To the uninitiated it may appear even more rational to have gone ahead and made the change, unknown to either the doctor or patient. What actually occurred was that this pharmacist explained to the customer that he didn't have this brand but would get it for him.

Such behavior cannot be dismissed as stupid. Six occurrences of this nature in succession, or even three, are more than coincidental. They are much more understandable as "nonlogical" actions deriving from the "residue" that prescriptions ought to be filled accurately and as appropriate expressions of the sentiments gathering about this norm. To the degree that the suggested solutions would have solved the problem ethically, there is an element of justice in using the terms stupidity, laziness, lack of initiative, etc. But the important point is that the professional attitude tends to prevent such "obvious" solutions from being seen. Subjectively the pharmacist's situation is so defined by the institutionalized code that the direction and range of rational action are limited.

The close relation between cleanliness, accuracy, and honesty has been noted, their functional utility suggested, and illustrative material cited from the practice of pharmacy. But do these traits and their relations appear elsewhere? Mention was made above (p. 322) that the tradition and approved modes of behavior were transmitted to each new generation of professional practitioners. It is logical to expect that this complex should make an appearance in the pharmacy schools. Significant evidence was discovered at one of the better colleges in Boston. An assistant professor of pharmacy had noted that those individuals who were sloppy in the laboratory were also careless as to accuracy and more prone to "switch," i. e., substitute. Significantly enough, when these students were cautioned about the practices, they replied that neither the patient nor the physician would ever be the wiser, asking, "What difference would it make?" The instructor, a phar-

macist, felt that his rejoinder that they, the students, would know and that this constituted reason enough, was accepted with reservations. The writer has no reason to believe that this incident reveals professional norms atypical of the great majority of pharmacy's professional schools.

The emphasis upon a code of ethics as the ultimate justification for these traits affords insight into the problem of substitution in drugstores. That substitutes are cheaper and offer a better margin of profit is understandable. But the problem is not so simple. The difficulty lies in the sincerity and good professional conscience of many otherwise ethical pharmacists. If it be argued that the preparations and chemicals substituted are identical, and it is often so, then why do not all pharmacists substitute? If they do not, how explain the others' good conscience? Some attempt to justify this practice by citing the saving to the customer, but this still does not avoid the dilemma.

The solution lies in the professional code itself, in a clash within it. The profession looks upon the United States Pharmacopoeia and National Formulary[11] as its own peculiar property. The feeling is strong throughout the profession that physicians should prescribe medicines under their official titles, not their trade-marked names. This feeling is all the stronger for the standards and formulas are determined by experts from the pharmaceutical, medical, and allied professions with a view to the provision of nonproprietary remedies for those trade-marked items which physicians have found useful. The very fact that pharmacists feel this way and attempt to proselyte the doctors, officially and informally, testifies to their adherence, on the whole, to the prescription as written. It is the writer's impression that this tension is part of the reason why pharmacists tend to look with contempt upon physicians who habitually call for patents, stating that such doctors are apt to be incompetent, "falling for" the sales talk of the drug manufacturer's detail man.

Thus the pharmacist is faced with a situation in which, as a professional man, he is torn between the duty of dispensing exactly what was ordered and that of using and encourag-

[11] These two volumes, abbreviated U.S.P. and N.F., the Homeopathic Pharmacopœia, and their supplements are "official compendiums" in that their standards and formulas are recognized as legal standards, enforceable by governmental agencies.

ing the use of official preparations, with the latter aided and abetted by his economic interest as a storekeeper. Given this situation and the urgent necessity for financial solvency, the reaction to temptation will be decided by the relative strength of the opposing pressures. There is reason to believe that an unknown but rather large amount of substitution does occur.

A subsidiary effect of the profession's tendency to minimize the use of patented medicines[12] is that as long as the initials U. S. P. and N. F. appear upon a preparation, the pharmacist's professional conscience is satisfied and free rein is given to his commercial interest in purchasing according to price, or, if cheaper, manufacturing himself. The latter alternative is also supported by professional pride. Any reluctance to buy the cheapest, any preference for more reputable but costlier brands may be attributed to suspicion as to quality, a predilection for the better, and whatever advertising value a nationally known label may have.

One other aspect of this profession's function and responsibility will be touched upon in closing. The cases cited have indirectly referred to the functional limitation of judgment and initiative as expressed in the institutionalized pattern and behavior. As has been stated elsewhere, pharmacy is an adjunct to medicine; all the responsibility for the exercise of initiative and judgment in diagnosis and treatment belongs to the physician. The responsible exercise of initiative and judgment by the pharmacist, therefore, is in the direction, paradoxically, of minimizing them. There is practically nothing he can do about a prescription if he is doubtful of it but get in touch with the doctor. Ethically, he may not discuss the therapeutic effects of a prescription or its composition with the patient; he may not question the competence or mode of treatment of a doctor should he have reason to suspect them; he may not, strictly speaking, suggest that aspirin be used for a cold. In making official compounds, complete formulas and step by step directions are provided when necessary. Technical proficiency alone is the pharmaceutical ideal.

So striking a difference between the two professions cannot but have characteristic organizational repercussions. In

[12] This is true of medicine also. It may be interpreted as an expression, in part, of the primacy of their functions and therefore of dissatisfaction with restraints upon the freedom to use whatever is worth while.

England the major registered professions, e. g., medicine and law, invoke expulsion on moral grounds, but not for technical incompetence. Chemists and druggists, on the other hand, may be removed from the register only for technical offenses. The fact that technical incompetence is at issue in malpractice actions serves to emphasize the dangers involved. Technique is an objective phenomenon; judgment is a matter of opinion in the application of technique. Were technical incompetence a ground for expulsion, judgment and experimentation would be stifled, for the safest thing to do would be to adhere to the traditional methods.[13] This would be functionally undesirable —at least in a culture which values efficiency and scientific progress at the expense of the traditional as such.

Pharmacy, drastically limited as to the assumption of responsibility, may then be expected to diverge from medicine and law in that violations of professional ethics are not considered serious offenses and tend to be ignored. Such is the case. There are no organizations in pharmacy engaged in the detection and punishment of violations of professional ethics. It is true that references to good moral behavior and professional honor appear in the code, but the professional associations and individuals are reluctant to take steps.[14] When they are taken, it is by private individuals who claim injury due to, or by a board of pharmacy prosecuting charges based upon, technical incompetence. In the latter instance the board members may be pharmacists, but they act not in their professional but in their official governmental capacity.

To recapitulate: We have attempted to point out in a specific profession the relation between its societal function and the institutionalized code which directs and limits the conduct of the persons subject to it. This is attained by the introjection of professional norms so that appropriate personality traits are developed and by so defining the situation that both functionally harmful and otherwise rational practices tend to be inhibited. The importance and strength of the

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[13] *The Professions, op. cit.*, pp. 396-400.

[14] If they did, the transgressor would lose little, since expulsion from an association does not involve loss of the license to practice. In addition there is the fact that most pharmacists are not members of the existing professional societies. This in itself is symptomatic of the weakness of professional sentiment and its relatively low status as a profession—a condition admitted by many pharmacists.

moral sanction has been demonstrated by relevant actual and hypothetical but typical instances. While the power of legal sanctions and economic interests is acknowledged, evidence has been presented which indicates that they can be subordinated to professional obligations. We have established the fact that ethical norms are valued for their own sake and noted their inculcation in the professional schools, together with the implications of the rejection of these norms for later behavior. And finally a relation has been traced between a functionally necessary disclaimer of responsibility and the professional societies' peculiar reaction to infractions of the ethical code.

"Pharmacy: The Functional Significance Of An Institutional Pattern"*

GEORGE URDANG
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Introductory Remarks. The title under which the following has been placed is a quotation. It is the heading of an excellent study published by Isidor Thorner[1] in the well known and highly technical quarterly "Social Forces, a Scientific Medium of Social Study and Interpretation".[2] Translated from its sociological jargon into plain English the title means an investigation of the influence of the "institutionalized" pharmaceutical code of ethics on the "function", i. e., the practice of professional as well as non-professional pharmacy.

Thorner's investigation being a sociological one, we have first of all to know what sociology means and aims at. Since the sociologists themselves do not agree as to its definition and objectives,[3] only a very rough explanation can be given at this

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* This paper is a commentary by Dr. George Urdang, Director of the American Institute of the History of Pharmacy, on Mr. Isidor Thorner's study which is published as the leading article in this issue. As Dr. Urdang states, he has attempted to translate the specialized language of the sociologist into the English which the pharmacist understands. We are grateful to Dr. Urdang for this service. We also appreciate Secretary Kelly's permission to publish this interpretation in this journal. He had considered publishing it in the Journal of the American Pharmaceutical Association, but realizing it would be more effective if published with Mr. Thorner's study, he released the priority to the American Journal of Pharmaceutical Education.—Editor.

1) Los Angeles, California.

2) Vol. 20, No. 3, May 1942, pp. 321-328, The University of North Carolina Press by Williams & Wilkins Company, Baltimore, Md.

3) There are distinctions between "formal" and "material" sociology and W. Sombart even assumed a definite contrast between "Western" and "German" sociology, the first being psychological, the latter noological or, as I would like to put it, the one based upon motion (respectively emotion) and the other upon notion.

place which, however, is sufficient for our present and exclusive purpose of making clear the general horizon under which Thorner's investigation stands and from which it receives its light as well as its meaning. With this understanding we may define sociology as the science concerned with the finding out and pointing out of the general rules underlying all human activities caused by the necessity to live together and to deal with other people.[4]

By its very nature sociology is abstract, and if there are practical consequences to be drawn from its findings it is not up to the sociologists but to those engaged in the practice of political or economic life to do so. The actual situations on which the sociologist bases his investigations may be specific. His conclusions, however, are general. As to our case, the pharmaceutical situation described by Thorner was to him merely the medium of the general illumination which he aimed at. He chose pharmacy as his experimental field because there is scarcely another calling so well fitted for the investigation of the influence of an institutionalized code of ethics on a special group of people. "Pharmacy," Thorner states, "is an occupation which presents a unique combination of professional and commercial elements. The very name, drugstore, is symbolic."

Thorner's statements as to the pharmaceutical situation are undoubtedly objective. Are they, however, in their totality, beyond dispute? They consist of general premises, of actual experiences of Thorner as well as hypothetical cases referred to as typical pharmaceutical trends or traits developed in consequence of the pharmaceutical code of ethics, and finally of some general and generalizing conclusions.

1. **The basic premises of the statements of I. Thorner.** There are two premises which form the basis of the entire investigation executed by Thorner, a more sweeping and a more specific one. The more sweeping premise discriminates between a "profession" and an "enterprise" and assumes that "the professional man's responsibility and loyalty are primarily to the most effective performance of the function while those of the members of an enterprise are directed toward the

4) It is of interest that sociology once has been defined as an attempt of materialism to transform itself into an objective science by adopting the means of psychology and the aspects of history.

organization," i. e., the welfare or business success of the "enterprise." That is certainly correct.

The more specific premise of Thorner's study is his assumption that only "the preparation of drugs is a professional service; their distribution is not." That is certainly incorrect. The sale of alarm-clocks, of stationery, of magazines, and all the other merchandise whether it is executed within drugstores or without is no professional service. The distribution of drugs is, and it is for this reason that it has been to a certain extent and should be throughout restricted to pharmacy.

In listing the essentials of a professional occupation Thorner mentions " . . . (2) a special technique, competence in which is demanded, resting upon; (3) a body of knowledge embracing generalized principles the mastery of which requires theoretical study," and he states that "the third criterion excludes skilled occupations which do not necessitate as indispensable a grasp of the sciences of other intellectual disciplines such as, for example, theology or jurisprudence."

It is a very special technique and a comprehensive body of knowledge requiring theoretical study that has to be possessed by the pharmacist in order to enable him to do the job in distributing drugs which the public is entitled to and does expect of him. How would the phamacist be able to identify drugs and detect adulterations, and in so far as possible, prevent the changes which many drugs undergo in the course of time or under changing conditions if it were not for that "special technique" and "body of knowledge" listed by Thorner as the most important "essentials of a professional occupation." It requires much and intensive "theoretical study" to become the scientific purveyor of drugs the pharmacist is supposed to be.

It is a historical fact that the distribution of drugs with its preliminary stages of identification and adequate preservation was based on the systematic arrangement and generalization of experience which we call science, previous to scientific manufacturing of drugs.[5] When the retail pharmacist of old was the main manufacturer of drugs, there was not much real science neither in pharmacy nor in medicine. It was the knowledge gained by analysis, *i. e.*, by testing and examining, that finally led to well planned synthesis, *i. e.*, to scientific manufacturing.

Thorner himself confirms the fact that the distribution of drugs is a part of the professional and not of the commercial side of pharmacy by the statement that "pharmacy colleges as professional schools are primarily engaged in teaching the principles of pharmacy, not salesmanship or store management." An ever increasing part of this teaching is devoted to the education of the student for expertness in the field of modern drugs, proprietaries as well as non-proprietaries, turned out by industry, in order to make the distribution a professional "function" in the service of public welfare instead of a mechanical sale with commercial profit as the only or main goal.

"The scientific administrator of drugs has to know all important data about them and has to be able to convey his knowledge to the physician and, with some tact and reserve, to the public. He has to be an all around man in the sciences concerned and his educators have to enable him to become one."[5]

Thorner gives a very significant hypothetical example of the part which knowledge and responsibility play in the distribution of drugs in stating the necessity of a query as to the use for which borax is wanted when the pharmacist is doubtful as to the purchaser's intent. "Borax," says Thorner, "instead of boric acid as an eye lotion may have serious consequences. While no legal penalties could result from such a mishap, the pharmacist might well feel morally responsible and experience the pangs of his professional conscience."

It is, therefore, the dealing with and in drugs by pharmacists in its totality, preparation as well as distribution, which constitutes "professional" pharmacy and the statements of Thorner concerning the "professional" activities of pharmacists have to be applied to both these branches or "functions" of the practice of pharmacy.

2. **Typical pharmaceutical trends or traits developed in consequence of the pharmaceutical code of ethics.** Adherence to the directions on a prescription, the proudly felt and executed responsibility as to errors of the prescriber, accuracy and cleanliness are stated by Thorner as typical pharmaceutical trends or traits developed in consequence of the pharmaceutical code of ethics, and he proves his statements by several examples. Thorner shows that even in cases in which accuracy

5) George Urdang, Pharmaceutical Education from the Historical Point of View, Am. Journ. Pharm. Educ. 6 : 53-60, 1942.

means a direct financial loss and strict adherence to a prescription a suppression of logical consideration, pharmaceutical ethics proves to be stronger and almost dogmatic. He quotes one case in which a prescription calling for a special brand of potassium permanganate was brought in to six stores without one of the pharmacists concerned trying to substitute another brand which they undoubtedly had on hand—or even to phone the doctor in order to get his permission to do so. All of them explained to the customer that they did not have the respective brand but would get it for him.

Thorner comments upon this case as follows: "To the degree that the suggested solutions would have solved the problem ethically, there is an element of justice in using the terms stupidity, laziness, lack of initiative, etc. But the important point is that the professional attitude tends to prevent such 'obvious' solutions from being seen. Subjectively the pharmacist's situation is so defined by the institutionalized code that the direction and range of rational action are limited."

From a pharmaceutical point of view there is not even "an element of justice" in using disapproving terms of any kind for the attitude of the six pharmacists concerned. The fact that the physician did not simply prescribe permanganate tablets but ordered a certain brand proved to the pharmacist that, for one reason or another, the doctor wanted in this special case this special brand. Substitution without the permission of the physician would, therefore, not "have solved the problem ethically" and was out of the question. The whole thing happened in a big city where the physician and the pharmacists could be sure that the respective brand could be obtained in some pharmacy, and the patient, in fact, received it in the seventh store to which he brought his prescription. Thus why waste time in phoning the physician? In all probability the answer would have been, let the patient try somewhere else. Thus ethics *and* ratio determined the attitude of the six pharmacists concerned.

This almost exaggerated adherence of the pharmacists to the prescription as written is, however, only the one side of the story. "There is reason to believe," says Thorner, "that an unknown but rather large amount of substitution does occur." It is conditioned by the special nature of the investigation of Thorner that even for these cases of misdemeanor he

finds professional reasons or thinks them at least possible. "The profession looks upon the U. S. Pharmacopœia and National Formulary as its own peculiar property," Thorner says. The professionally minded pharmacist "attempts to proselyte the doctors, officially and inofficially," to prescribe medicines under their official titles, not their trade-marked names. Finally Thorner assumes that the pharmacist, being of the conviction that the U.S.P. and N.F. preparations are not inferior to any brand, "is torn between the duty of dispensing exactly what was ordered and that of using and encouraging the use of official preparations, with the latter aided and abetted by his economic interest as a storekeeper."

If this holds true, and for a restricted number of cases it offers indeed a plausible explanation, all the educational influence possessed by the pharmaceutical associations and colleges has to be put into action in order to eliminate this kind of reasoning and acting.

However, for most cases of substitution not a professional but an unprofessional attitude is responsible. Thorner reports the experience in a college in Boston that those students "who were sloppy in the laboratory were also careless as to accuracy and more prone 'to switch', i. e., to substitute." He tells that the answer of these individuals, when cautioned about the practices, was "that neither the patient nor the physician would ever be the wiser." It is these elements that disgrace not only pharmacy but all professions of trust they are allowed to enter upon. To keep them away from pharmacy or to cause them to leave it, belongs to the foremost duties of pharmaceutical educators.

The direction and the scope of Thorner's observations and conclusions are determined by his opinion that "pharmacy is an adjunct to medicine". This statement is consistent with his restriction of "professional" pharmacy to the "preparation of drugs" and it explains the fact that it is the filling of prescriptions by the pharmacist which according to Thorner is almost the only really "professional" pharmaceutical activity or "function".

If, however, we regard pharmacy not as an adjunct but as a branch of medicine, destined to meet *all* medicinal needs of the people, be it on the basis of medical advice or in response to the initiative of the individuals concerned, the scope would

naturally be broader and the direction somewhat changed. Being the representative of a branch of medicine, the pharmacist is much more independent in his activities as well as in the application of his ethical principles than he could be within the limitations implied in the term "adjunct to medicine".

Thorner does not overlook the fact that in reality the responsibilities of the pharmacist are the same whether he dispenses drugs on the prescription of a physician or without. However, only in the first case Thorner assumes the obligating force of a specific pharmaceutical code of ethics, while according to him in the second one merely a reflection of this obligation upon a non-professional activity becomes effective. What that means becomes evident from Thorner's statements as to the sale of poisons and hypnotics. Thorner relates the fact that the same pharmacist who will handle "bichloride of mercury, strychnine, and arsenic, when called for on prescriptions in quantities totaling perhaps not more than one grain, most gingerly and with scrupulous care," sells relatively huge amounts of the same poisons upon formal assurance that the purchaser is going to use these substances on rodents or as insecticides and is aware of their poisonous nature.

"If this sale," Thorner says, "is not altogether routine, it is precisely due to the possibility that the public health may be involved." That is exactly what is expressed in Chapter I of the Code of Ethics of the American Pharmaceutical Association by the statement that "the pharmacist should hold the health and safety of his patrons to be of first consideration." Whenever and wherever this "health and safety" is at stake. in the distribution as well as in the preparation of drugs, and finally in the sale of poisons, it is, therefore, professional ethics which directs the activity of the pharmacist.

The contrast seen by Thorner in the attitude of the pharmacist as dispenser of small amounts of poison on prescription and as distributor of large amounts according to the legal regulations of the sale of poisons is in fact non-existent. In the first case the dose is of highest importance, while the knowledge of the nature of the substance concerned is unimportant if not even undesirable. In the second case there is no dose, and of importance are only the awareness of the purchaser of the dangers connected with the employment of the substances concerned, and the conviction of the vendor that there is no mis-

use intended. That the sale of poisons, as a matter of principle, belongs to the domain of professional pharmacy becomes evident from the fact that through the entire history of pharmacy the distribution of poisons has found its legal regulation in close connection if not even as a part of the legal regulation of pharmacy. There are several "Pharmacy *and* Poison Laws" at present in force within the United States of America (District of Columbia, Idaho, Maine, Montana, New Jersey, Rhode Island, Tennessee, Wyoming), and in England the "Pharmacy and Poisons Act" of 1933 has made the Pharmaceutical Society of Great Britain the official supervisor of the distribution of poisons as well as of all other pharmaceutical activities.

The attitude of the pharmacist toward the sale of hypnotics is according to Thorner another illustration of "the influence of professional ethics upon the sale of a commodity unregulated by law". He relates that, although in Massachusetts the sale of barbiturates at present is not prohibited by law, "the manager of a busy Boston drugstore refuses to sell Veronal and similar preparations too freely because he feels it not ethical." "His policy," says Thorner in quoting the pharmacist concerned, "is not to sell these things, because the customer's health comes first, before profits. Pharmacists have a sixth sense on these things—when not to sell."

Thorner gives another excellent example for this "sixth sense" or, to put it in a more definite way, this selective professional sentiment. The Code of Ethics of the American Pharmaceutical Association was issued in 1923, *i. e.*, during the prohibition era. It, therefore, admonishes the pharmacist to merit his responsibility by upholding and conforming to the laws and regulations governing the distribution of narcotic drugs *and* alcoholic liquors. "The legal penalties and the intricacy of the methods of keeping track of the quantities purchased and sold were, if anything, more rigorous in the case of liquor. Yet, then as today, narcotic violations were practically non-existent. How the liquor laws were 'observed' is notorious . . . Since the forces of legal sanctions and profit incentives were about equal, neither the fear of punishment nor the hope of gain can be considered as satisfactory motivations explanatory of the differential in violations. The element of moral responsibility, however, brings into play a moral sanction sufficiently powerful to account for this difference."

As to liquor, most pharmacists opposed in their capacity as citizens the law they were supposed to obey, and there was nothing in their professional ethics to counteract this opposition. As to narcotics, their professional ethics has been in full accord with the law, the one supporting the other. If any proof is needed for the fact that the adherence of the pharmacist to professional ethics is not as dogmatic and even "unlogical" and void of initiative and judgment as Thorner in some instances assumes, it is given by the pharmaceutical attitude toward narcotics on the one hand and liquor on the other during the period of prohibition.

3. **Conclusions drawn by I. Thorner.** The general conclusions of Thorner are of interest at this place only if and as far as they are not merely drawn from but reflect upon pharmacy. That is the case with his statement that, using pharmacy as the field of investigation, "evidence has been presented which indicates that they, (*i. e.*, legal sanctions and economic interests,—) can be subordinated to professional obligations."

Besides his general conclusions, however, Thorner offers two other ones dealing specifically with pharmacy. The first, stating "that when the specific function of pharmacy is involved, a powerful moral obligation of conformance to its ethical code comes into play" does not ask for any comment. That cannot be said of the other conclusion of Thorner, reading as follows: "Technical proficiency alone is the pharmaceutical ideal." Thorner bases this dictum on the fact that in his preparatory work the pharmacist is bound to a medical prescription on the one hand, and to his standards, the U. S. Pharmacopœia and the National Formulary, on the other. It is Thorner's erroneous premise, *i. e.*, his restriction of "professional" pharmacy to "the preparation of drugs" which leads him to this conclusion. The duties of the pharmacist as the distributor, *i. e.*, as the scientific administrator of drugs require more than mere "technical proficiency." As has been shown before, they demand an individual fully aware of his moral obligations and using his knowledge as well as his skill consciously and deliberately on the basis of his own judgment.

The Code of Ethics of the American Pharmaceutical Association[6] contains besides the chapter concerning "The Duties

6) Yearbook of the Am. Pharm. Assoc. 1930, vol. 19, pp. XLV-XLVII.

of the Pharmacist in His Relation to the Physician" (Chapter II) two other ones, dealing with "The Duties of the Pharmacist in Connection with His Services to the Public" (Chapter I) and with "The Duties of Pharmacists to Each Other and to the Profession at Large." If someone wants to know more about "the pharmaceutical ideal" of today, he will find an excellent source of information in the recently published address of E. F. Kelly, "Trends in Pharmaceutical Practice."[7]

Thorner points to "characteristic organizational repercussions" proving the striking difference between the restricted pharmaceutical ideal and the broader ones of other professions. "In England," he says, "the major registered professions, e. g. medicine and law, invoke expulsion on moral grounds, but not for technical incompetence. Chemists and druggists, on the other hand may be removed from the register for technical offenses." It is understood that in pharmacy technical incompetence can more easily be proved than in medicine and law. However, is technical incompetence in England the only legal basis or even an expressly mentioned one for the removal of a chemist and druggist from the register? Part I, 7·(1) of the English Pharmacy and Poisons Act of 1933[8] reads as follows:

"If a registered pharmacist or a person employed by him in the carrying on of his business has been convicted of any such criminal offense, or been guilty of such misconduct as, in the opinion of the Statutory Committee, renders him, or in the case of an employee, would if he were a registered pharmacist, render him, unfit to be on the register, the Committee, after making inquiry into the case, may, subject to the provisions of this Act, direct the registrar to remove the name of the pharmacist from the register."

Appeal to the High Court is provided for which will prevent arbitrary action by the Statutory Committee of the Pharmaceutical Society of Great Britain. However, there is nothing in the Act supporting the opinion that the jurisdiction of the Committee is restricted to cases of "technical incompetence."

Conclusion. Pharmacy has all reason to be grateful to Mr. I. Thorner. His study represents a scholarly attempt at fixing

7) Journ. Am. Pharm. Assoc. Pract. Ed. 3:92-99, 1942.
8) The Chemist and Druggist Diary 1934, p. 245.

the position of pharmacy within society, and it deserves high appreciation for its excellency in employing the methodology and terminology of sociology as well as for its delicacy in dealing with the problems of pharmacy. Thorner has, in the opinion of the author of these lines, erred in one of his basic premises which mistake led him to some erroneous conclusions. He has, however, very well observed and in an extremely interesting manner commented upon typical happenings, trends and traits in pharmacy. Thorner's study gave to pharmacy an opportunity of self-examination. For that we have to thank him.

By the scientific means of reasoning, offered by sociology, Thorner has proved that pharmaceutical ethics is the natural consequence of the "function" professional pharmacy has to fulfil in the service of society and that the Code of Ethics of the American Pharmaceutical Association is not imposed upon pharmacy but merely "institutionalizes" the moral responsibilities that are an integral part of the profession. He has shown furthermore that pharmaceutical ethics not only dominates the professional duties of the pharmacist but has imbued the latter with a personal moral feeling that even reflects on the commercial activities executed in pharmacies. Pharmacy accepts the objective which Thorner presents by the following quotation from C. I. Barnard:[9]

"The Profession Aims And Claims To Become A Moral Unit."

Some of the Newer Biologic Methods for the Control of Infectious Diseases*

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I have been asked to discuss some of the newer biologic methods for the control of infectious diseases and in the time allotted to me I cannot do more than refer briefly to those that have become available in recent years.

The principles of biological therapy rest upon a few rela-

9) Chester I. Barnard. The Functions of the Executive, Cambridge 1940.

*Read in the Scientific Session, Centennial Celebration, School of Pharmacy, University of Maryland, June 4, 1941.

tively simple facts. The resistance of the body to disease, while very complicated if examined in all its details, depends in most instances primarily on the presence in the blood stream of certain specific globulins which we call antibodies. All of us have learnt from observation that it is but seldom that a person suffers more than one attack of a disease such as scarlet fever. The first attack has caused the formation of antibodies specific against scarlet fever and the individual has become resistant, but only at the expense of an actual attack of the disease with its concommitant risks of permanent injury or even death. Now it is not necessary to placidly await the attack of a disease to insure future protection. We may inoculate persons with the disease producing agents, either dead or in modified and avirulent form, and cause the persons so inoculated to respond to the injection with the formation of specific antibodies (say to typhoid) without suffering the inconvenience and risk of an actual attack of the disease. Such an inoculum is called a vaccine and the condition it produces, which is usually of long duration, is called active immunity. On the other hand we may administer to a person recently exposed to or actually suffering from a given disease antibodies to the disease prepared in some other animal or human body. Such treatment, termed serum therapy, produces passive immunity and is only of short duration. At best it is an emergency treatment and must be repeated on the occasion of subsequent exposures.

It has been stated that in all wars of modern times as many combatants are incapacitated by disease as by wounds. One of the most fatal and frequent infections has been that of tetanus. In the last World War the only measure that was available to combat this disease was the prophylactic administration of tetanus antitoxin given after a wound had been received, and in spite of the very widespread use of this antitoxin, particularly in the Allied Armies, the mortality from this disease was considerable. At that time tetanus toxoid, used for active immunization against tetanus or lock-jaw, was unknown. Successful immunization of man with tetanus toxoid was first described in 1933 and these early indications of its value have already been confirmed in the present war by the experience of the British army. Thus although in the evacuation of Dunkirk by the British, all of the English troops

wounded had not been immunized with tetanus toxoid, a sufficiently large proportion had been so immunized that only one out of every 2000 developed tetanus as contrasted with 16 in 2000 under comparable conditions in the previous World War. Particularly striking was the fact that not a single case of tetanus occurred in the troops actually immunized with tetanus toxoid. Because of these results, the personnel of the U. S. Navy is being immunized with alum precipitated toxoid and the entire U. S. Army will be immunized with plain tetanus toxoid. Furthermore, it has been found that by the use of tetanus toxoid it is possible to completely immunize horses and mules against that infection. Monnier and Lebasque state (Rev. D'Immunol.4:405,1938) that of 16,500 horses immunized with tetanus toxoid over a five-year period not a single animal developed tetanus while in a previous five-year period at least one out of every 330 contracted tetanus and out of every 440 horses one died of tetanus in spite of the use of antitetanus serum.

There is a condition, particularly affecting infants, known as influenzal meningitis, which is an exceedingly fatal disease for the very young. Prior to the use of serum, 90 to 100% of children contracting this disease usually died and in very young children the mortality closely approached 100%. 70% of the cases occur in children under two years of age. It should be made clear that influenzal meningitis bears no relation to the clinical condition known as influenza but is caused by a bacteria known as Hemophilus influenza type B, while the disease influenza, as is well known, is due to a filterable virus. In 1939, Dr. H. E. Alexander described an anti-serum prepared in the rabbit against this organism and which she had been using with encouraging results in the treatment of influenzal meningitis. Following her work it has been developed that the use of anti-influenzal meningitis rabbit serum has reduced the mortality from 90-95% in untreated children to approximately 30%.

Whooping cough is one of the most fatal diseases of childhood, particularly in children under two years of age, but the use of vaccine has made it possible to protect a large percentage of children against this disease. In 1933, Sauer (J.A.M.A., 100:239) reported success in the immunization of children with a pertussis vaccine prepared from recently isolated

strains. In 1939, Kendrick & Eldering (Am. J. of Hyg., 29:123, 1939) reported the results of a carefully controlled study in pertussis immunization carried out for 5 years. They established the value of their vaccine and obtained their most striking result in the protection of children exposed to other cases of whooping cough in the family. When exposed children had not received injections of pertussis vaccine, 80 out of every 100 contracted the disease, while of the exposed children who had been immunized, only 17 out of 100 contracted the disease and of the 17 cases, 6 were very mild and non-whooping cases which ordinarily would not be diagnosed as whooping cough. As a result of these studies whooping cough vaccine is being used more and more. At least one state and one major city are supplying whooping cough vaccine for immunization of all of the children in the same way that toxoid for immunization against diphtheria and vaccine for vaccination against smallpox are being supplied. The present trend would indicate that in a few years immunization against whooping cough may be just as common as immunization against smallpox.

More and more attention is being given to routes of administration of biologic products other than injection for the prevention of infectious diseases and this will require changes in the old familiar products. For example, several investigators have used the nasal route for active immunization. Recently, Fraser, Davy and Halpern (Can. Pub. Hlth. J., p. 376, August, 1940), have reported success in using a highly concentrated diphtheria toxoid dropped in the nose as a means of regaining immunity. They found that 83% of individuals who had been actively immunized several years previously showed a definite increase in the antitoxin content of their blood after intranasal administration of concentrated toxoid. A re-immunization procedure which does not require injection will appeal to all children and not a few adults who do not like hypodermic needles. Another example of a new use requiring a changed product is the use of dried scarlet fever toxin made into tablets and taken by mouth for immunization against scarlet fever. In December 1940, Dick and Dick (J.A.M.A., 115:2155, 1940) reported success by such a method in rendering susceptible individuals immune to scarlet fever. They found that 102 persons receiving toxin tablets ranging from 47 to 91 million skin test doses distributed

in graduated amounts over a period of from two to three weeks were rendered 94.7% Dick negative.

Another new method of use for an already well established biologic product is shown by the adoption in the army of intradermal injections for re-immunization against typhoid fever. Longfellow and Luippold (Am. J. of Pub. Hlth., 30:1311, 1940) reported that re-vaccination with a single dose of O.lcc. of typhoid vaccine, intracutaneously administered, constituted a reliable method of renewing immunity to typhoid fever and should be the method of choice. The recommended procedure for immunization in the Army is to give the usual standard course of three subcutaneous injections of typhoid vaccine and then reimmunize every one or two years with an intracutaneous injection of O.lcc. of vaccine. One of the great advantages of re-vaccination by this effective method is that severe reactions to the intracutaneous injections are extremely rare. Tuft (Am. J. of Medical Sciences, 199:84, 1940) recommended that the intracutaneous method of immunization be used for primary as well as re-immunization. He suggests giving intracutaneous injections of O.lcc., O.15cc., and O.2cc. of the ordinary typhoid vaccine at weekly intervals for the primary vaccination.

Another definite trend in biologic products is the use of combined preparations for immunization against more than one disease with a single course of injections. For some time the French have been using tetanus toxoid combined with typhoid-para-typhoid vaccine, and MacLean (Lancet, No. 6115, p. 581, 1940) found that the combination of tetanus toxoid with typhoid-paratyphoid vaccine was a better immunizing agent against tetanus than tetanus toxoid alone. It was found that two injections given a month apart were effective. All of the soldiers in the Italian army are being immunized with a mixture of tetanus toxoid and typhoid vaccine. Along this same line the following recommendation was made in an editorial in the March, 1941, issue of War Medicine—"Since tetanus toxoid has been satisfactorily combined with diphtheria toxoid and with typhoid para-typhoid vaccine with no greater reaction than if each were employed singly, this combination deserves universal adoption as a means of producing immunity to diphtheria, tetanus, and the typhoid-para-typhoid group."

Still another trend in the improvement of biologic products for control of infectious diseases is in the preparation of toxins and toxoids with a minimum amount of foreign or non-specific proteins. Mueller (J. of Immunol., 37:103, 1939), described a method for preparing diphtheria toxin on a media free of peptone or meat extract. The toxin on this media was from two to three times more potent than that obtained on the usual peptone-meat-extract medium.

Mueller and Miller (Proc. Soc. Exp. Bio. & Med., 43, 389, 1940), also reported success in growing tetanus toxin of high potency on a similar medium containing no peptone or meat extract. Furthermore, there has recently been reported success in preparing a highly potent scarlet fever toxin, free of demonstrable protein, on medium free of peptone and meat extract. The advantages of these preparations are two-fold. First, the potencies of the toxin are higher than the average potency heretofore obtained and, second, the toxins are much purer and so may cause fewer undesirable reactions when they are injected for active immunization against their respective diseases. These preparations represent a long step forward toward the ideal of immunization with the pure antigens.

The methods just discussed are concerned with the prevention or treatment of disease caused by bacteria, organisms that can readily be cultivated upon appropriate media and studied under the microscope. However, there is another large group of transmissable diseases which are commonly referred to as the "virus diseases" and which are now being intensively studied in many laboratories.

Specific therapy of virus diseases at the present time lags far behind that of diseases due to bacteria. The almost unbelievable success which has recently been obtained in the chemotherapy of bacterial diseases unfortunately has not been duplicated with viruses, with the exception of lymphorgranuloma venereum, trachoma and inclusion blenorrhea. Moreover, the very biological principles on which virus infection rests make it difficult, if not impossible, to treat virus diseases once they are established in the body. The incubation period for such diseases is long and, to outward appearances, uneventful. During this silent period the virus in question settles down and multiplies in the very cytoplasm of the live cells. Once safely within this cytoplasm it is, as far as we know today, safe from

all chemotherapeutic or other attack. Yet in all cases symptoms do not appear in virus diseases until the agent is firmly established within the specific cells which it attacks and treatment at such time will, therefore, not affect any virus except that which may be liberated from such cells as are destroyed during the course of infection.

All our efforts at the biological control of virus diseases are, therefore, at the moment directed towards their prevention. In most cases this prevention is attempted by means of active immunization carried out before exposure to the disease, but in certain instances, notably rabies and measles, prevention or at least modification of the disease is possible after the initial infection but before symptoms appear. Recent advances in this connection are in the nature of improvement of the existing prophylactic weapons rather than the invention of new ones. Thus with regard to rabies, it has been shown by Webster in an extensive series of experimental studies that improvements of the vaccine at present available can be obtained if material containing very high initial titres of virus be used in preparation and, if, further, the present methods for inactivation of the virus be replaced by one in which inactivation is carried out by ultraviolet irradiation.

The use of the globulin fraction obtainable from normal placenta in the prevention and modification of measles in children who have been exposed to the virus is nothing new. However, the use of this readily available biological agent has been lessened because on the one hand methods of standardization of potency of the product have been lacking and because preparations of immune globulin previously available have been of considerable toxicity and have produced such unpleasant reactions that the use of them in pediatric practice has seemed to many inadvisable. Recent advances have rid the preparations of immune globulin of the toxic action while maintaining full activity, and preparations now available give less reaction than do many preparations of convalescent or adult serum, the other available prophylactic tools. Moreover, although we are still unable to titrate preparations of immune globulin directly for antibodies to the virus of measles, it is now possible to titrate for other viral antibodies which it is hoped, in large enough pools, will give a sufficiently close answer to our question as to the potency of a given preparation in measles antibodies.

In virus diseases, however, the most important advances have been made in the active immunization with either inactivated or with active but modified virus. In the case of inactivated virus the greatest advance that has been made would seem to be the development of technique for obtaining the virus in high concentrations, i. e., in the neighborhood of 100 million to 1 billion infective units per gram of infective tissue. The possibility of producing active immunity with inactivated virus has been the subject for intense study and discussion. Even today there are many who do not believe that effective immunization with inactivated virus is possible.

Such a belief would, however, seem to be contrary to the known facts. Thus the value of vaccines for eastern or western equine encephalomyelitis prepared from formalin-inactivated virus grown in chicken embryos, in which it multiplies to reach very high titres, would seem to have been established in the last four years, not only as a laboratory procedure but also as a practical method for the protection of horses exposed to infection with these viruses in the field. Furthermore, recent studies with the rickettsial group of infectious agents (that group which occupies an interesting intermediate position between bacteria and viruses) have shown that not only in the laboratory but also in the field (for example, amongst persons whose work demands their presence in the tick infested and highly dangerous regions of the Bitter-Root Valley in Montana) high degrees of resistance can be produced by the inoculation of inactivated rickettsia. Suspensions of rickettsia in high concentration have been obtained from tissue cultures of agar slants (method of Zinsser) from the infected yolk sac of developing embryos (method of Cox) or from infected rat lungs (method of Casteneda). Inactivation has been produced by means of heat, formalin, phenol or merthiolate and satisfactory vaccines are obtained by all the different methods.

In Yellow Fever several different vaccines containing active virus have been employed and successful results have been obtained. In the vaccine which is most widely used at the present time the virus, though fully active, has been modified by repeated passage in tissue culture so that although it retains its full antigenic properties and protects the vaccinated person against disease on subsequent exposure to yellow fever,

the vaccination procedure produces no untoward results or at most only a mild and transient attack of fever and malaise.

Attempts to obtain vaccines of value in prophylaxis against influenza are at present being made in many different laboratories but no clear cut success has yet been obtained. The problem is complicated by the fact that the disease which all of us (doctors and laymen alike) know as influenza can be produced by many different viruses, some of which have been isolated and identified and others which are only suspected to exist on the basis of complicated reasoning. It is obviously impossible to vaccinate against these viruses whose very existence has not been proved and since the clinical picture produced by known and unknown viruses is apparently identical, only careful serological studies in laboratories used to handling such tests will give the essential information as to the results obtained from a given vaccination study. Experimentally, however, the problem can be greatly simplified and, under these conditions, results which offer some promise have been obtained recently from the use of a formalin vaccine consisting of mixed tissue culture of the type of influenza virus at present most prevalent in the United States (Virus A) and of what appears to be a variant of distemper virus isolated from ferrets and not pathogenic for man. This latter virus seems to have the property of enhancing the immunizing activity of the dead influenza virus by an as yet unexplained synergistic action. Major advances in the prophylaxis of influenza may well occur as a result of the studies now in progress but for the reasons given above the problem is apt to be more difficult than has been the case with other virus diseases.

Very recently attention has been turned to the activity of certain saprophytic bacteria. It has been known for many years that many of these saprophytes produce substances antagonistic, even lethal, to other organisms. At the present time all of the work on this problem is of a preliminary nature. It can be stated, however, that, as Dubos with a spore bearing soil bacillus and Fleming with a mould have shown, fractions can be isolated from these saprophytes of such high activity that dilutions of 1 part in 800,000 are lethal for pathogenic micro-organisms. Of what use such substances may be in therapy remains to be proved but already promising results have been obtained both with Gramicidin (from the Dubos bacillus) and Penicillin (from Fleming's mould).

This brief review of the recently available methods for the biologic control of infectious diseases shows that while they are significant and of much importance, yet with a few exceptions they do not approach the marvelous results in the treatment of some bacterial diseases by some recently discovered chemotherapeutic agents. I, of course, refer to the various sulfonamide derivatives, such as sulfanilamide, sulfapyridine, sulfathiazole, sulfadiazine and sulfaguanidine. These new compounds not only have been found to be therapeutically extremely effective in pneumons, streptococcus and staphylococcus infections, gonorrhea and erysipelas, but even in certain infections of the intestinal tract. While these agents have largely displaced therapy in certain infections by specific antitoxins and sera, it must not be forgotten that prophylaxis, even more than therapeusis, still depends upon biologic agents which contain specific antigens.

The Evaluation of Drugs by Biological Methods*

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Please let me first tell you how proud I am to have this honor of participating in your Centennial Celebration; for this school to have so successfully weathered the vicissitudes of a hundred years is worthy of profound and respectful commendation.

The subject, "The Evaluation of Drugs by Biological Methods," which Doctor Hartung assigned me, is one which could be discussed much more profitably by any one of several members of your own, eminent faculty; and notably Director C. W. Chapman. I shall trust your charity to see me over the rough courses of this, my feeble attempt. I shall begin by discussing several pertinent generalities, then list the biologically assayed drugs of the Pharmacopœia, and finally, speak in detail of certain problems of biological evaluation as they present themselves in the standardization of digitalis.

Most of the drugs with which you and I come in contact are standardized for therapeutic efficacy and constancy, either by chemical means or by biological methods. Typical of the

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*Read in the Scientific Session, Centennial Celebration, School of Pharmacy, University of Maryland, June 4, 1941.

definite criteria for chemical standardization is that for acetylsalicylic acid U.S.P. XI: "Acetylsalicylic acid, when dried to constant weight over sulfuric acid, contains not less than 99.5% $HC_7H_1O_2C_2H_3O_2$." Exemplary of the biologically evaluated group is strophanthin; of this, the Pharmacopœia states, "Strophanthin, when assayed as directed, shall possess a potency equivalent to the activity of not less than 40% and not more than 60% of ouabain when similarly assayed." It at once becomes apparent that chemical assay is much more exacting than biological.

The evaluation of drugs by biological or bioassay methods should be regarded as a branch of pharmacology. The early days of pharmacology from the time of Buchheim in the 1840's to the turning of the present century, were concerned primarily with qualitative studies; a study of what drugs did, and to a lesser extent why. Beginning with our own time, pharmacology has busied itself additionally with the question of how much: quantitative pharmacodynamics. In 1872[1] Squibb described a bioassay procedure for aconite based on the ability of this drug to produce tingling of the tongue when tasted. Probably the first preparation to be assayed biologically in the modern sense was diphtheria antitoxin; this was done by Ehrlich, beginning in 1898. Simultaneously Houghton[2] proposed a frog method for standardizing strophanthus preparations and mentioned the use of a "standard" preparation.

In light of present day considerations, a drug that is evaluated biologically is one whose potency is tested on living tissue. This technic determines strength or extent of pharmacodynamic effect rather than chemical identity. To prevent discrepancies from the many sources which might influence tissue response, this strength of physiological effect of the product under question, is compared with that produced by a chosen standard. Table 1 illustrates the fluctuations encountered in a series of tests, made on different occasions, dealing with the actual toxicity of a digitalis leaf for frogs[3]. If on each occasion the toxicity was also determined on another leaf as a standard, then although fluctuations occurred, these would be in the same direction for both and hence the ratio of toxicity between the two leaves would be the same for each test. Each test should give more or less identical comparative values irrespective of actual figures; this conception of comparison

with a standard forms the basis for the modern evaluation of drugs by biological methods. Insistence on the use of a standard obviously is of major importance; and it places great responsibility on those charged with its selection. Of rather recent introduction in the continuous quest for improving the accuracy of biological methods, is the testing of the experimental data by proper statistical means. And so a satisfactory biological test for assay purposes rests on the following triad:

1. A suitable test object, be it frog, guinea pig, or man. Incidentally the reaction used as a criterion of activity need not be related to the therapeutic effect, although this is usual. It is absolutely necessary however, to know whether the principle (or principles) responsible for evincing this reaction is the therapeutically important one.
2. A suitable standard. This standard must naturally reflect the true therapeutic value of the drug. This requirement has at times been ignored.
3. A suitable statistical treatment of the experimental data for the purpose of a more accurate evaluation of their significance.

It is natural to ask why are not all drugs standardized chemically, inasmuch as the requirements for this procedure are usually much more stringent and hence their fulfillment should insure a greater degree of constancy. This method of assay is not always possible because of three reasons:

1. The chemical nature of the active principle or principles may not be known.
2. There might be a mixture of active principles of such a nature that chemical assay would not consistently reflect therapeutic activity.
3. The chemical procedure might be so involved as to make biological assay, although not as exact, more practicable.

However, the assay of drugs biologically should be regarded merely as a stop-gap in the progress of drug standardization. Promotion from the biologically assayed group to the chemically assayed group should always be hastened. It should be understood that criticism of bioassays is not necessarily directed at their lack of sensitivity. Frequently biological assay will detect quantities of a substance too minute for chemical analysis. For instance, using the isolated guinea pig uterus 1/10,000 mg. of histamine can be detected. Compared with chemical assay methods however, these procedures are deficient in differential quantification. To differentiate biologically between two histamine quantities of the order of the sample just given, there would have to exist a difference of about 20%.[4]

Although not specifically pertaining to bioassays in the or-

dinary sense, it might be remarked that pharmacological experiments in general and toxicological ones particularly, could advantageously be approached from the biological assay point of view; namely, that one standard be selected for comparison. For instance, to state that a lethal dose of some new solvent is 10 cc. per Kgm. body weight for rats when given orally would mean much more if at the same time a similar experiment were done to estimate the toxicity of some better known, similar substance, such as acetone. Such an experimental procedure would give an understandable comparative figure; for example, it might be found that the new material is twice as toxic as acetone. This would serve to orientate interested workers in thinking of this new substance. Equally as important is the fact that such an arrangement would permit a check by other investigators. These, because of variations so frequently intrinsic in biological experimentation, might obtain different figures, but ordinarily the ratios would be the same.

There are several types of biological assays depending on what criterion is selected for the end point. For example, death of an animal may be used. This is exemplified in the assay of aconite on guinea pigs. On the other hand, one might select the degree of change of some physiologic phenomenon; the standardization of insulin is done by observing its ability to lower the blood sugar in the intact rabbit. Again, tissue completely isolated from the animal might be used, as in the assay of solution of posterior pituitary on the guinea pig uterus. Bioassays, such as that for insulin, based on some physiologic change definitely related to the therapeutic action of the drug would seem preferable, particularly until the pharmacodynamics of the substance is thoroughly understood.

One is struck in examining such encyclopedias of biological assays as that of Munch, by the great variety of procedures and animals used in this phase of pharmacology. Among the animals used are: frogs, mice, rats, guinea pigs, rabbits, cats, dogs, roosters, pigeons, flies, chick embryos and, of course, man.

On contemplation of some of the indirect influences of the use of biological assay methods on the progress of pharmacy and pharmacology, several thoughts come to mind. One might wonder if biological assay methods have not at times stifled chemical research. For instance, with the introduction of

what appears to be a satisfactory biological assay method, is not some of the stimulus needed to further chemical isolation and assay of the active principle, inhibited? It seems that with but few exceptions when once a drug becomes a biologically standardized drug, it remains in that group. Of course, the inherent diffculties of chemical assay may be at present insurmountable. On the other hand, it must be admitted that biological assay studies have been helpful in elucidating new, heretofore unknown active principles. Notably, an instance of this is the rather recent discovery of ergonovine by a former member of your faculty, Dr. M. R. Thompson,[5] and others.[6 7 8]

It might be of interest now to briefly consider several preparations in the U.S.P. XI which are evaluated by biological methods. Table 2 is an outline of such a consideration.

Now let us consider the problems incident to the evaluation of digitalis. Perhaps no biological assay method has provoked so much discussion as that used for the standardization of this drug. Because of the importance of the drug and because the discussion which has waxed around its assay illustrates many pertinent points, it would appear fitting to close with a discussion of its standardization.

In 1911 Haskell[9] wrote "It seems to be generally admitted that there is no satisfactory method for the chemical assay of the drugs of the digitalis series." This statement holds as well today. But what of the present situation as viewed in regard to biologically assayed digitalis? In April of this year in response to the self-imposed query "Are the Results of the U.S.P. Frog Method for the Assay of Digitalis Applicable to Man?", Gold, Cattell, Kwit and Kramer[10] said: "The answer is no. Prior to any official method of assay, specimens of digitalis on the American market were reported to vary in potency by as much as about 300 per cent. Evidence has been adduced indicating that the intensive work on the assay of digitalis during the past 35 years has not improved that situation sufficiently, and that preparations of outstanding tinctures of digitalis at the present time vary by nearly 300 per cent when assayed by the cat method, although they are labeled U.S.P. XI."

The two assay procedures of prominence are the official frog method and the cat method of Hatcher and Brodie. The frog method has already been briefly described (Table 2). In the cat method, the digitalis preparation is injected slowly into the femoral vein of an anesthetized cat at such a rate as to

cause death in from 60 to 90 minutes. The "unit" is obtained by dividing the amount of drug necessary to kill by the weight of the animal; the result is the lethal dose in terms of mg. (or cc.) per Kgm. body weight; this figure being the "cat unit". Classically a good leaf had a cat unit value of 100 mg. (or 1 cc. of the tincture) ; now, due to the introduction of a new digitalis standard, it is a less definite value, although the figure of about 65 mg. appears acceptable [11 12] for a pharmacopœial product. To negate individual variations among animals it is customary to use from 5 to 10 animals in each assay; from the individual figures is calculated the final average value. While the original method called for no standard of comparison, it is now suggested[3] that from time to time in each laboratory this assay test be made on the standard reference powder of the Pharmacopœia so that comparative values can be given. A point of difference between the two assay procedures is that in the one (the frog method) the question of absorption is a factor, whereas in the cat method the drug is injected directly into the circulation. It is conceivable, therefore, that a preparation be highly active by the cat method and, because of poor absorbability be of definitely weaker potency by the frog method. The difference between the two technics becomes apparent when observations are made on the rate of deterioration of tincture of digitalis. Table 3 lists results obtained by Stasiak[13] who studied the question of digitalis deterioration by both procedures. According to these findings and in keeping with other studies, tincture of digitalis shows appreciable deterioration when tested by the frog method, but not when tested by the cat method. It has been suggested that this is due to the fact that the tincture, on aging, becomes less absorbable from the lymph sac. Recent tests in man indicate practically equal absorption for the freshly prepared tinctures and those several years old.[14]

The standard for the frog method was, in the U.S.P. X, ouabain. Inasmuch as this chemical was regarded to be a poor practical standard for digitalis, Magnus, as early as 1923, proposed as an international standard a digitalis powder consisting of a mixture of powdered digitalis leaves of various sources. This seemed logical and so on the adoption of U.S.P. XI, our official reference standard was changed from ouabain to a mixture of digitalis leaves of different origins. Somehow the potency of the pharmacopœial standard was not in too

good relation to the international standard nor to what had been the activity of digitalis as assayed by the U.S.P. X method. Between this and the standard there is a discrepancy of some 25-30% or more. This unfortunate change in potency necessitates use of a correction factor during standardization; ignorance of this apparently led at least one investigator into difficulties and accounted for one pharmacologist overdigitalizing himself.[11 15 16] Interestingly enough no clinical observations were made on this standard powder prior to its adoption to determine whether or not it did what was to be ordinarily expected of digitalis. Only recently have such observations been made by Gold who has found the powder satisfactory.[17]

When digitalis is used clinically Gold, et al[10] have found that the results obtained from the cat method more accurately reflect therapeutic expectancy than those from the frog method. However, even the cat method leaves much to be desired; so much so that Gold[14] recommends abandonment of the Galenical preparations and the use of one of the purified active principles such as digitoxin.

Here then we have a biological assay procedure for an important drug in which first, there is not agreement as to the best experimental procedure to be employed; second, there have been serious difficulties with the standard; and finally, there is the recommendation that the whole question of its bioassay, as it applies to human medication, be ignored in favor of the use of purified principles.

Perhaps this experience with digitalis, the first of the biologically assayed pharmacopœial drugs, will serve as a strong, favorable impetus towards more intensive research on the other drugs likewise now biologically evaluated.

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TABLE I.

ACTIVITY IN ACTUAL FROG UNITS* OF A DIGITALIS POWDER AS DETERMINED AT DIFFERENT TIMES

1935	September 27	1,510 frog units per gm. powder
	December 23	2,600 " " " " "
1936	February 1	3,300 " " " " "
	April 9	1,850 " " " " "
	June 10	2,500 " " " " "
	July 17	1,310 " " " " "

From Biological Standardization by J. H. Burn, Oxford Press, 1937.

* A frog unit in this instance means the amount necessary to kill 1 gram of frog.

TABLE 2.
Biologically Assayed Drugs of U. S. P. XI

Drug	Test Animal or Tissue	Criterion	Mode of administration	Standard	Remarks
1. Aconite (Root & Tincture)	Guinea pigs	Fatality	Subcutaneously	Aconitine	A deviation of 20% above & below standard allowed.
2. Digitalis (Leaves & Tincture)	Frogs	Systolic stoppage of heart	Lymph sac	Reference digitalis powder	A deviation of 20% above & below standard allowed.
3. Strophanthin	Frogs	Systolic stoppage of heart	Lymph sac	Ouabain	A deviation of 20% above & below standard allowed.
4. Solution of Epinephrine HCl	An anesthetized dog	Change in blood pressure	Intravenously	Standard epinephrine	
5. Ergot (Sclerotium & Fluidextract)	White leghorn roosters	Darkening of comb	Intramuscularly	Ergotoxine ethansulfonate	1 gm. equivalent to not less than 0.5 mg. standard.
6. Activated Ergosterol in oil	Rats	Like cod liver oil (D)	Orally	Reference cod liver oil	1 gm. contains not less than 10,000 U. S.P. units D.
7. Solution of Posterior Pituitary	Guinea pig uterus	Conraction of uterus	Directly	Reference standard posterior pituitary powder	A deviation of 20% above & below standard allowed.
8a. Cod Liver Oil 8b. Non-destearinated Cod Liver Oil	Rats	Growth & condition of eyes (A) Bone calcification (D)	Orally	Reference cod liver oil	1 gm. contains at least 600 (850 for 8b) U.S.P. units of A and at least 85 U. S.P. units of D.

9. Natural Vitamin A in Oil	Rats	Like cod liver oil	Orally	Reference cod liver oil	1 gm. contains from 50,000 to 65,000 U.S. P. units of A & not more than 1,000 units of D.
10. Natural Vitamin A & D in Oil	Rats	Like cod liver oil	Orally	Reference cod liver oil	1 gm. contains from 50,000 to 65,000 U.S. P. units of A and from 10,000 to 13,000 U.S.P. units of D.
11. Capsicum (Fruit & Tincture)	Man	Sensation of pungency	Orally		Pungent taste in two out of three subjects.
12. Liver (Extract, Solution & Purified Solution)	Patients with pernicious anemia	Response of blood elements	Orally & Parenterally		
13. Stomach	"	"	Orally		
14. Pepsin[1]	Egg albumin	Degree of digestion	Directly	Reference pepsin	Digest from 3000-3500 times its weight of egg albumin.
15. Arsphenamine & Neoarsphenamine	Rats	Fatality	Intravenously		This test is to determine "relative non-toxicity" of product.
16. Solution of Parathyroid	Dogs	Increase in blood calcium	Subcutaneously		
17. Diphtheria Antitoxin	Guinea pigs	Protection against fatality	Subcutaneously	Standard antitoxin serum	

[1] Listed by Cushny's Pharmacology & Therapeutics (12 Ed., 1940) as a biologically standardized preparation.

TABLE 2. (Continued)
Biologically Assayed Drugs of U. S. P. XI

Drug	Test Animal or Tissue	Criterion	Mode of administration	Standard	Remarks
18. Diphtheria Toxoid & Refined Diphtheria Toxoid	Guinea pigs	1. Toxicity (local & general) 2. Antigenic activity	Subcutaneously	2. Diphtheria test toxin	
19. Diphtheria Toxin for the Schick Test	Guinea pigs	Fatality	Subcutaneously		
20. Scarlet Fever Antitoxin	Man	Neutralize local effect of toxin	Intracutaneously	Standard scarlet fever streptococcus antitoxin	
21. Scarlet Fever Streptococcus Toxin	Man	Skin reaction	Intracutaneously	Control toxin	
22. Tetanus Antitoxin	Guinea pigs	Protection against fatality from toxin	Subcutaneously	Standard tetanus toxin	

TABLE 3.

EFFECT OF AGING (3 years) ON TR. DIGITALIS
(Comparison of Frog and Cat Method)

Preparation	Percentage Activity Lost	
	Frog Method	Cat Method
1	25	2.2
2	38.5	16.8
3	58.2	6.5
4	58.2	10.3
5	60.0	20.6

Stability of Digitalis Tinctures Prepared by Various Methods, by A. Stasiak, Arch. Pharm., *272:* 743, 1934.

Recommended Training for a Pharmacognosist*

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A pharmacognosist's training should be in accordance with the services which he ultimately will be called upon to perform in the field of his choice. Therefore I should like to recommend to the incoming officers of this Conference that they continue to incorporate this topic of discussion into their programs, and that they select the men who are to discuss it from the various fields of work into which pharmacognosists may find their way. The basic training for all will doubtless be essentially the same, but it would be interesting indeed to hear what specialists in their own particular lines of endeavor have to offer on the subject of the training men should have who intend to serve in their departments.

Inasmuch as there has not as yet been any particular subclassification of pharmacognosists to illustrate the point in mind, we may draw on another field of training to clarify more effectively the intent of the foregoing statements.

Suppose one has a problem in electrical engineering which requires expert advice. It isn't taken to just any engineer, but rather to a man who has specialized in electrical engineering. The same would hold true for civil engineering, mechanical engineering and chemical engineering. It seems that it is high time that pharmacognosists took cognizance of the need for a similar specialization within their own field of instruction, especially where graduate instruction becomes involved, and then

* Read before the Conference of Teachers of Pharmacognosy and Pharmacology at the 1941 meeting at Detroit.

proceed to map out programs of study which will qualify our students to fit themselves efficiently into one phase of the picture. It spreads an individual pretty thin for him to attempt to become an expert in all branches of the field of study, although we are compelled to do this at the present time.

A recent incident clarified the situation in the writer's mind, the reiteration of which may provoke some serious thought from a group such as we have assembled here. The S. B. Penick Company last spring decided to improve their drug plant cultivation projects in the United States and needed a man to supervise the undertaking. It may interest you to know that they did not see fit to select that man from among the ranks of the pharmacognosists, but obtained the services of an individual trained in the field of horticulture. The writer is well acquainted with the man they employed, has never heard him express even the slightest interest in medicinal plants, and was rather surprised at his decision to quit the position as head of a horticulture department in order to enter this field. At least it should open our eyes to the possibilities which are within our profession if we will but take advantage of them.

We can not pass off the implications of situations like this one, but rather we should scrutinize our field of work all the more carefully, seeking an explanation as to why any crude drug grower should be compelled to turn his back on the very profession which justifies his being in business. The answer probably rests in two words, "inadequate training". The company needed a man with some knowledge of farm management, of soils, of hybridization and selection, and of bimetrical methods. Presumably it must have been impossible to locate such a man in pharmacy, but presumably too it should not be impossible to develop a recommended course of training in graduate study in pharmacognosy which would develop an individual of this type. We should attempt to recognize our limitations so that we can overcome these bottlenecks in our professional training program, and especially so for our graduate students.

For too many years we have been confining the training in the minor field for pharmacognosists to the old accepted ideas of botany, phyto-chemistry, and the like, thereby completely overlooking the possibilities which existed in the related departments of genetics, soils, horticulture, and even agronomy.

It would be a distinct advantage to a pharmacognosist who planned to grow anything at all in the way of medicinal plants to know something about the possibilities of hybridization and selection, or even about soil factors. Better medicinal plants are possible the same as better farm plants, but the pharmacognosists will have to discover them as a result of having had the recommended training of men who are experts in the art of growing plants. They can supply us with the theories; it is up to us to make the practical applications of that knowledge to our own profession.

To adequately express an opinion on the subject of this paper, it becomes necessary first of all to take into consideration the purpose and intent of the duties which that man must perform when he is finally placed in a position of responsibility. The duties are not always the same, and therefore it seems that it would be desirable to have several experts discuss this topic in order that we may learn their attitude toward the training men should have in the respective fields. Men for the several fields might be classified as follows:

Histological Pharmacognosist:—A man expertly trained in preparation of drugs for microscopic study and in the preparation and interpretation of the monographic descriptions of our Official Books. His work would deal essentially with studies involving plant cells and tissues and their application to pharmaceutical problems.

Manufacturing Pharmacognosist:—A branch of pharmacognosy which would demand the services of a man familiar with the problems of large scale buying and handling of crude drugs. Drug sampling, drug milling, assay determinations, drug extraction, drug storage and deterioration, and commercial methods should be a part of his training.

Microanalytical Pharmacognosist:—A person qualified to the highest degree in the use of all micro-analytical procedures to be used in a medico-legal way. Micro-sublimation, microchemical reactions, micro-polarization, micro-crystallography, *etc.*, are rapid and certain means of detecting fraudulent and criminal practices. Persons who plan to enter this field should have some instruction in the fundamentals of law included in their training.

Production Pharmacognosist:—A man who plans to enter upon a career of growing and harvesting drugs for commerce.

Current foreign troubles will doubtless see a shifting of some of this industry to the United States, and we will need trained men to take charge of the projects. A representative from a large California fruit growers exchange recently commented that Italy has already lost their lemon and orange oil industry. Others will follow.

Teaching Pharmacognosist:—A person trained in the art of preparing young people to enter the profession of pharmacy as a means of serving the public in our national health program. This should be one of the chief and foremost aims of our pharmacy colleges.

The duties for each of the above will vary, and therefore the recommended training for majors entering these different fields should be selected in accordance with their prospective future need. From the above mentioned groups the writer has selected the teaching pharmacognosist as being of particular interest.

It would be remiss indeed to allow such an opportunity as this to escape without making this observation which will no doubt cause many to smile. Discounting the old saying that teachers are born and not made, the writer would like to suggest at least, the inclusion of some fundamental training in the subtle art of preparing and delivering interesting and instructive lectures as a part of every teacher's training. One of the most frequent criticisms to reach the professional teacher's ears is the comment, "he knows his stuff cold, but he sure can't get it across". Pharmacognosists ought not to be guilty of this demeanor, when there is such a wealth of interesting material to be drawn from in the discussions about crude drugs.

No one will question the statement that chemistry, botany, pharmacy, plant physiology, and taxonomy constitute basic training for the teaching pharmacognosist. It is when we go beyond this training that we are in need of serious thought as to the recommendations which should be made relative to the training program.

In our pharmaceutical curricula of today there is a fair grouping of the subject matter into three major fields namely, pharmacy, pharmaceutical chemistry, and materia medica which includes both pharmacognosy and pharmacology. This grouping brings together the subjects which are most closely related and the men who are most intimately associated. It

is a logical arrangement inasmuch as any balanced curriculum must have a logical sequence of courses in order that all of the studies will be completed in good time thereby serving as preparatory measures for the more difficult subjects which are to follow. Every pharmacognosy teacher therefore should study the relative aims and purposes of his courses so that he will be in a position to better serve in his present position, and also be better able to recommend the type of training to prospective teachers of the future which will make them most proficient and helpful to their institutions. That however is not always an easy matter, for different institutions stress different types of training as essential to their program. Until this is ascertained we can but generalize and hope for the future.

With full realization that a multiplicity of opinions are possible on this score it is the writer's very definite opinion that pharmacognosy serves its most useful purpose as a foundation course for later studies in pharmacology, materia medica, or toxicology and therapeutics, any one of which implies the study of the action of drugs on the body tissues. That being the case it becomes imperative that the pharmacognosy teacher should have good training in these subjects in order to more fully appreciate its bearing on the later studies in those subjects.

At the time pharmacology was first making its debut in the curricula of the pharmacy colleges, the writer had the occasion to visit several of the men who were scheduled as teachers of the subject. Queried concerning the aids and handicaps which they had encountered in promoting their courses, one quickly learned that pharmacognosy was very much involved in this new development.

Some pharmacology teachers were quick to criticize their supporting pharmacognosy departments for their lack of training in the actions and uses of drugs. They even maintained that many false impressions were taught, and that a complete lack of appreciation of the drugs' full action and potency was the rule rather than the exception. Conversely others were non-hesitant in proclaiming the virtues of their pharmacognosy associates for the excellent background they were giving their students prior to their registration in pharmacology. There had to be a reason behind these diametrically opposed opinions, and it looked like it would be well to find out before

it was too late why some pharmacognosy teachers were very successful and others were less so. Only then could a so-called recommended plan of training be worked out which would most likely be successful.

The solution of the problem presented itself during the several years of teaching following the completion of the M. S. degree and later return to school. Those first years of teaching were carried on with the aid of a pure pharmacognosy background of training, and there was a distinct feeling that a knowledge of botany and pharmacognosy alone was not filling the teaching needs in that particular institution. Frequent conferences held with the pharmacology and materia medica teachers during those years showed very clearly that in order to best serve the school's program, some additional training in physiology, anatomy, and pharmacology was needed. More pharmacology was included in the recommended training of the pharmacognosist for the simple purpose of making him a better teacher of pharmacognosy.

Later experience has proven the wisdom of that recommendation, for nothing has added more enjoyment to teaching about drugs than an understanding of how they act. It is an enjoyment which comes from the feeling of a job well done, and a feeling that pharmacognosy is at last better serving the college, the students, and the profession as a whole. For that reason alone an understanding of how drugs act should be a part of the recommended training for all teaching pharmacognosists.

The Training of a Pharmacognosist*

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The character of the scientific and professional services rendered by the pharmacognosists of today is both varied and exacting.

Whether they serve as teachers of the subject, research workers, consultants, laboratory control workers in crude drug establishments, pharmacognosists in the federal service or as

* Read before the Conference of Teachers of Pharmacognosy and Pharmacology at the 1941 meeting at Detroit.

state or federal inspectors of drugs and insecticides, their duties are such as to call for a rather broad general and technical education if they are to be resourceful and competent.

The time has long passed when the scope of pharmacognosy in America was limited to crude drugs, their adulterants and substitutes. Today, not only these but also their derivatives, the spices and condiments, insecticides, rodenticides, resins, waxes and oils used in industry, antigenic substances, the fibers used in the paper and textile industries and various other materials of vegetable and animal origin fall within its domain.

To properly qualify for work involving the identification, selection, valuation and preservation of these materials derived from the biological kingdoms which vary from entire organisms to organs, tissues and cell contents, not to mention the numerous other kinds of work entailed in the practice of pharmacognosy, requires not only that the person be a keen observer and be possessed of sound senses of sight, smell and taste but that he be possessed of a sound basic training in those pure sciences which he may be called upon to use in solving the problems of pharmacognosy, namely, botany, plant genetics, chemistry, physics and zoology.

The curriculum of the average undergraduate course in pharmacy in this country, today, is in my opinion inadequate preparation for the practice of pharmacognosy. It is inadequate because it is rightly planned to train students primarily for the practice of pharmacy. However, there are many aspects of it which lead me to believe it superior to the academic undergraduate curricula such as those leading to the Bachelor's degree in biology or in chemistry, if only one of these undergraduate courses can be pursued by the prospective student. I can well testify to its helpfulness, for my own experiences in applying various pharmaceutical and chemical techniques learned while a student in a college of pharmacy have been numerous.

Its chief weakness from the practical point of view is that it does not go far enough into the subjects of botany, plant genetics, microscopy, zoology, crystallography, pharmacognosy and plant chemistry. Again, the average time allotted to foreign languages is wholly inadequate to take care of the necessary translation of German and French papers on pharma-

cognosy, the available English abstracts of many of which are too brief to be of real value to the worker.

I believe a satisfactory training for the practice of pharmacognosy today should include a graduate course based upon the Bachelor's degree in which the student would be required to take advanced courses in botany including plant morphology with stress on the morphology of the spermatophytes, plant genetics, plant taxonomy with especial stress on medicinal and poisonous plants, plant physiology and distribution, economic botany, pharmacology, scientific German and French, technical microscopy, histological technique, invertebrate and vertebrate anatomy (if not elected in the undergraduate course), plant chemistry, advanced pharmacognosy in which the student would be given opportunity to diagnose a large variety of types of commercial biological materials with the best of facilities and also receive some training in chemical technique, and a course in animal histology. There should also be a thesis requirement in the graduate course based upon a problem in pharmacognosy, and the candidate for the graduate degree should possess a reading knowledge of scientific German and French.

Finally let me stress the need of adequate training in a good herbarium being given the student who intends to practice pharmacognosy, for in determining identity of plant materials it is frequently necessary to resort to the herbarium in running down clues gained from their morphological and chemical examination.

Audio-Visual Education in Pharmacy

EDWARD S. BRADY II

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The most valuable contribution to educational methods in the last decade has been the introduction of the motion picture into the lecture room. More recently the addition of sound to sixteen mm. films has placed at the disposal of educators in all fields a doubly effective medium of instruction. Some groups have quickly taken advantage of the opportunities offered by audio-visual education. In the field of medicine, student and practitioner alike are instructed in unusual surgical procedures and made familiar with less common pathological con-

ditions through the medium of the motion picture. In the present defense effort principles of aereodynamics are demonstrated to student pilots, embryo mechanics are made acquainted with the complicated machines of their trade, and even the householder is educated in first aid, incendiary bomb defense and other pertinent subjects by the use of sound pictures which are available in these varied fields. There are, however, many fields in which audio-visual education is not used, and this condition may be due to several factors. Often, lack of knowledge of films available or inability to integrate such films with the teaching program has discouraged the adoption of audio-visual methods. In other instances, the lack of projection equipment, instructors who are familiar with the operation of such equipment, or lack of suitable rooms for the presentation of sound pictures have been deterring factors. Also, for many groups, no pictures have been available.

Pharmacy has, until now, belonged to this latter category. Although films on related subjects—chemistry, physics, botany and zoology—were nationally distributed, no films dealing with pharmaceutical techniques were ever produced. This is easily understood since educational films are, like textbooks, a commercial venture. Film production costs are high, and wide distribution must be assured to make the venture a profitable one. The limited number of colleges of pharmacy, alone, then, would doom to financial failure any effort in educational film production on pharmaceutical subjects.

Early this year, with full cognizance of these conditions, work was begun on a series of pictures for use in pharmaceutical education. Produced by Poulson Films of Los Angeles, under this writer's technical direction, and with the cooperation of the University of Southern California College of Pharmacy, two pictures of a series titled "Pharmacy Techniques" have so far been completed, with production of others planned.

A fortunate combination of circumstances is making the production of this series possible. Not the least of these factors is the author's close friendship with Wm. R. Poulson, owner of Poulson Films, who possesses a keen interest in educational picture production, complete 16mm. sound film equipment, studio and lighting facilities, and a laboratory for motion picture film development, printing and processing. These resources, together with the availability of the scientific pharmaceutical equipment of the University of Southern California

College of Pharmacy, have reduced the financial problem involved to a minimum. Other problems have, however, been encountered, but have so far been surmounted. Some are unique and interesting. For the initial production, necessarily experimental in nature, a demonstration of the use of the Whitall-Tatum suppository machine was filmed. A simple set was constructed, representing a typical work table in a prescription pharmacy, and the steps in the preparation of cocoa butter suppositories, including a pictorial explanation of the parts of the machine, was photographed. The heat from the floodlights melted the cocoa butter quickly, necessitating frequent stops. Photographing white powder on white papers or on a porcelain pill tile gave lighting problems. Much of the pharmacist's work was done with the left hand or with the hands in an awkward or unnatural position to make the manipulations visible to the camera. Simple, natural actions were repeated so many times to allow photography from different angles, that the pharmacist became confused and clumsy. Despite these difficulties, some 800 feet of 16mm. film was sent to the processing department where it was developed and edited.

Although the cutting room returned less than half of the original film footage, there was contained on the one 400-foot roll a complete film story, beginning with the receipt of the suppository prescription by the pharmacist, following him through the entire process of their preparation, and fading out on the finished, boxed suppositories. Recording the commentary to accompany these scenes was then undertaken, and the elaborately worded paper which was first offered for recording was revised, simplified, rehearsed many times, and eventually recorded. With titles added, the sound film was viewed by students in elementary prescription practice classes and was shown at the Annual Pharmacy Alumni Conference. Comment was uniformly favorable.

With this encouraging reaction, the second film of the series, "Powders, Capsules, and Cachets" was planned more elaborately. A larger prescription case set was constructed, dramatic sequences in synchronous sound showing the use of these preparations were provided for, and the production in general was more extensive. This film shows the preparation of bulk powders, the folding of single dose powder papers, the hand filling of capsules, the use of the capsule machine, and the

preparation of cachets or Konseals. Other films under consideration are "Pills and Tablets," "Solutions," "Ointments," "Emulsions," and "Ampuls." Possible subjects would be almost endless in number if the many fields related to pharmacy were included.

The value of audio-visual education has been proven in every field into which it has been introduced, and it is certain that it can be of assistance to pharmaceutical educators. The instructor in pharmacy who has done a laboratory demonstration before a large group, knowing many were inattentive because they did not have a good view of the proceedings, or who has by word, gesture, and blackboard drawing attempted to explain the operation of a tablet machine, should appreciate an opportunity to darken the room, press a switch, and in 10 to 15 minutes show the complete process under consideration from the best possible angle, knowing every student in the room is equally accessible and unusually attentive.

Glenn Frank has said "When the camera was married to the microscope and the radiograph it became the most subtle instrument of scientific research and demonstration we have yet had. The film . . . . . can bring reality and objectivity into the school which has always had the fault of being too abstract. We suffer nationally today because we deal too much in vague words, dim conceptions, and inexact abstractions. The film can train a generation that will keep close to objective reality, think in terms of things, and bring greater realism into our affairs."

Medicinal Botanicals and Their Culture

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(S. B. Penick & Company) Seattle

The high prices quoted for medicinal botanicals has aroused an interest in their home cultivation. Articles are appearing in print under the following captions:—"Plants seen playing a part in aiding the United States"; "Victory garden planted with belladonna"; "Experiments (in plant cultivation) will help determine the self-sufficiency of the U. S." One result of all this is numerous requests for information concerning what and how to grow medicinal plants.

It may be assumed that one reason for wanting to grow medicinal botanicals is the possibility of a fair financial return. In short the "propaganda" mentioning the high prices suggest the possibility of obtaining a greater profit from their cultivation than from the cultivation of standard farm or truck garden products. The question then is—what medicinal botanicals can be cultivated commercially at a *profit* and not just which ones will grow in any given area or soil.

Many of the colleges of pharmacy having medicinal botanical gardens as part of their instructional equipment are reporting, through this journal and other publications, that they are enlarging their gardens; increasing the activity of the work or conducting special experiments either independently or in cooperation with some other interested group. The results of this experimentation will be published some time as it has been in the past and it is hoped that the reports will not be lacking the most important factor, namely, the cost of production in terms of labor hours required.

It is well known that many medicinal botanicals are native to the United States. Hence it may be assumed that they will grow in the United States. Based upon the distribution of these native botanicals the soil and climatic area may be selected. This having been done the next item is propagating material. Needless to say that is a troublesome factor at the present time. Then the prospective grower wishes to have the answers to the following questions:

How many labor hours are required for:—

1) Preparing and planting propagating plots to supply one acre?
2) Planting one acre of a given botanical?
3) Cultivating and irrigating one acre for one season?
4) Harvesting the crop from one acre?
5) Curing and packaging the crop from one acre?

Other factors contributing to the production cost are, the loss of plants after transferring from propagating beds to field; the effect of disease and insects and proper methods for controling each; the improper curing and storage of the product; the loss of biennials and perennials during the winter season and the tonnage yield per acre.

From the above data the production cost may be approximately determined and the cost is the factor that will control the cultivation of medicinal botanicals now and after the war.

Commercial? Yes. But the cultivation of medicinal botanicals will only be carried on if it is successful commercially. Experimental gardens conducted as "advertising" material are of interest and have their educational value but they do not come under the caption of "helping to determine the self-sufficiency of the United States."

Most of the experimental gardens lack sufficient space to cultivate acre plots. Cooperative movements with nearby farmers can be inaugurated whereby the "garden staff" contribute materially to the development of the garden plot allowing the farmer the benefit of the harvested crop. The college may even be required to contribute financial aid through fellowships and other endowments, to assist in obtaining special equipment for the harvesting or the curing of the product. Local or campus greenhouses may be used for propagating the stock and community curing houses may be constructed in a given area. Often the latter are available in the form of hop or fruit dryers or tobacco sheds.

Careful supervision and instruction must be given during the harvesting and curing of the crop so that it will meet the required standards. The average farmer or grower is not familiar with these standards. Control work should be conducted during the season in order to determine the proper time for collecting the product, so it will be of the highest quality and at the same time the largest tonnage. This control work is simple in connection with alkaloidal, glucosidal or any products with measurable active constituents. The proper time for the collection of fully matured seed is important. Germinating tests should be conducted with samples collected from time to time during the season.

As these are "growing" products most of the supervisor's time will be required during the summer months. This is vacation time for many of the directors of the experimental gardens, hence the work would not interfere with their instructional duties. Agricultural experiment stations and agricultural agents are willing to devote much of their time in assisting the farmer with the development of a new "crop". However they lack the information necessary for the cultivation of medicinal botanicals. Unless the colleges of pharmacy utilize their special facilities and knowledge in developing this field the agricultural college will, sooner or later, take over this work as has already been done by one southern college.

At first the amount of time required by any one instructor for the supervision of several acres under cultivation may seem quite large, but as a matter of fact after the preliminary work has been done the amount of time required is comparatively small, and the compensating experience and results obtained can be used to advantage by the supervisor in his every day instruction. He will receive a mental stimulus from his efforts to develop a short cut in any one of the numerous steps from planting to packaging the product; from attempting to devise special methods or modified equipment for planting, harvesting or curing the product. Every attempt must be made to reduce the labor cost. The report of his laboratory experimentation together with the practical information will not only be read, but will be studied with interest and will contribute materially to the question, "Can the United States be self-sufficient in producing medicinal botanicals?" To me, if I may venture a personal comment, this field of work offers great possibilities for research of a scientific and practical nature, results that may be a contribution of national economic importance. A comparison of the early work of the agricultural colleges when they first began to assist the farmer with cultivation problems, and the present structure of agricultural experiment stations and their many ramifications, may offer a suggestion as to some of the possibilities of this phase of research.

The Safeguard of Every Pharmacist--- A Knowledge of Pharmaceutical Law

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As one approaches the Library Building at the University of Colorado, he sees the following inscription engraved in the stone structure over the door: "He who knows only his own generation remains always a child."

After a few moments of reflection upon this quotation, one must come to the conclusion that learning of the experiences of those who have preceded us in our field of endeavor must be of great value in aiding us to avoid the pitfalls along the road. With maps available at every filling station, the modern traveler has little or no excuse for losing his way on a

well-charted course. It is true that one may encounter difficulties never before experienced by those who have previously traveled over the route. However, in most cases these difficulties could have been foreseen had the map been consulted with the proper amount of alertness.

After reading Arthur's "The Law of Drugs and Druggists" one is greatly impressed by the number of legal proceedings which have been brought against pharmacists because they failed to read the chart before proceeding on their course. Many costly law suits could have been avoided and in some cases lives could have been saved had the pharmacists used the amount of care which the law requires them to exercise.

Because of his work as one of the protectors of the public health of the community, the pharmacist must have knowledge of many laws which are concerned with his profession and the other public health agencies. Although it is an arduous task to read all of these laws and to obtain a proper understanding of the methods of procedure under them, this practice must be followed if the pharmacist wishes to avoid trouble with the government authorities and with certain types of customers who are eagerly awaiting a chance to "cash in" on mistakes which creep into the pharmacy when the doors of caution are swung open.

Many of the laws which at first appear to be needlessly stringent or unnecessarily detailed afford valuable protection to the pharmacist if they are properly heeded. The Colorado Pharmacy Law states that the pharmacist must satisfy himself that the purchaser of a poisonous drug is aware of the poisonous nature of that drug and that it is to be used for a legitimate purpose. Had one Kelly, a clerk in the Stamper Drug Company at Fort Morgan, Colorado, followed the strict interpretation of the law, it is probable that strychnine would not have been delivered to a customer who alleged that he called for quinine. Doubtless a life would have been saved; the law suit for damages, Campbell v. Stamper Drug Co., 85 Colorado 508 (1929) would never have occurred, and Kelly himself would have been free from great mental anguish. Cases of a similar nature are to be found in the law reports of other states.

Although there is no statutory law stating that the pharmacist must not be negligent in the conducting of his business,

the courts of our country have held that the pharmacist must use ordinary care in applying his skill as a pharmacist. "Ordinary care" with reference to the business of a druggist must therefore be held to signify "the highest practicable degree of prudence, thoughtfulness, and vigilance and the most exact and reliable safeguards consistent with the reasonable conduct of the business in order that human life may not constantly be exposed to the danger flowing from the substitution of deadly poisons for harmless medicine." Tremblay v. Kimball (1910) 107 Me. 53.

Many damage suits concerned with alleged or admitted negligence of pharmacists in filling prescriptions have been tried in our civil courts. Needless to say one of the most common causes of injury to customers and subsequent legal proceedings against the pharmacist is the failure of the pharmacist to take necessary precautions in the labeling of the powerful drugs which he dispenses. Damages have been awarded in several cases for injuries resulting from the substitution of a harmful drug for a harmless one in a prescription. In the case of Jones v. Walgreen Co. (1932) 265 Ill. App. 308, the sum of $10,000 was held as reasonable damages for injuries resulting from the taking of pure strontium salicylate negligently substituted in a prescription filled by the defendant drug company.

State laws have been passed which make it a criminal offense to prescribe or administer drugs or medicines with intent to produce abortion. Pharmacists, in general, are very diligent in their efforts to avoid the violation of such laws. However, in some cases they fail to realize what great caution must be exercised in the dispensing of abortifacient drugs.

Since the enactment of the Federal Food, Drug, and Cosmetic Act, June 25, 1938, many new regulations have been formulated to make the law effective. Doubtless, within a short period of time many cases concerned with this law will be found in the law reports. A study of these cases together with cases concerned with the narcotic and hypnotics law and the numerous other laws directly affecting the practice of pharmacy would be of great value to the pharmacist. By learning of the trials and tribulations of other members of his profession, one may avoid similar unpleasant experiences.

In their professional field the pharmacists are privileged men since they alone are licensed to carry on the duties for

which they have been especially trained. A man's responsibility usually increases in a direct ratio with the added freedom allowed him; consequently in his professional work the pharmacist must exercise more caution than the ordinary citizen. In many cases the pharmacist is also a business man. This means that training in the fundamentals of business law will be of great intrinsic value to him in his business. Finally as a citizen of the community, he should take not only an active interest in the public laws passed for the benefit of public welfare, but he should also aid in formulating new and better laws for this purpose.

A perusal of all of the legal cases arising from the practice of pharmacy or the conducting of a business will make the intelligent pharmacist aware of the fact that without proper precautions what has happened to other pharmacists may happen to him. Consequently, it seems proper that students in our colleges of pharmacy should receive adequate training in the laws concerned with the practice of pharmacy. Furthermore, it would seem that the time is propitious for the board members to consider the advisability of asking more questions covering the legal aspects of the profession or even of giving a separate examination in pharmacy law.

In conclusion may I add that knowledge gained in the "School of Experience" is often quite valuable, but the tuition rate of the school is abnormally high.

The Medical College of Virginia, School of Pharmacy.—The accelerated program began July 6, with the usual September opening being moved up to that date. The session will close in March. There was a drop in enrollment, but the total decrease was less than anticipated. The loss was in the freshman class which has 32 members in comparison to last year's 45.—On May 14, the Mortar and Pestle Club and Rho Chi Society gave their annual joint banquet. Dr. Ernest Little, dean of Rutgers University College of Pharmacy was the guest speaker. He was made an honorary member of Rho Chi at this meeting. Other members initiated into Rho Chi were: James T. May, Jr., Herman Nachman, Walter M. Allen, and Mr. J. T. Wallace, President of the Virginia Pharmaceutical Association.—Milton Baygell of Toledo University and Cheng Long Hooi of Columbia University began their pharmacy internships in June.—Miss Doris Vermilyea, a graduate of Rutgers University, College of Pharmacy, and Mr. John S. Hofner, a graduate of Toledo University, College of Pharmacy, have been added to the staff as hospital pharmacists and instructors in pharmacy.—Frank P. Pitts, assistant professor of chemistry, became the third member of the faculty to join the armed forces. He is a Captain in General Hospital Unit No. 45, the medical unit sponsored by the College.

Editorials

Professional Complacency

Professional complacency—a willingness to be satisfied with objectives already reached without consideration for present and future responsibilities—is the greatest enemy of the professional group which is serious enough to set up a goal for itself and then bend every effort toward reaching it. That is as true in pharmaceutical education as it is in any other field, yet the danger of complacency stands before us now, as we strive to meet a definite war time emergency.

If we pause right now and look back at what has been accomplished in pharmaceutical education, we may well feel a justifiable sense of pride. A lot has been accomplished in the past two decades. During World War I and the years which followed, more progress was made in pharmaceutical education than our predecessors made in all the previous century and a quarter of its existence. There are very good reasons for that. The modern day needs which became apparent during and following the war impressed upon us the fact that pharmaceutical education as it had existed for more than a hundred years was simply and completely inadequate. Abbreviated courses of study, containing material which had been the product of ancient practices, only faintly modernized, could not begin to meet the challenges of a new and highly scientific world.

Once awake to the real pharmaceutical needs, our progress was rapid and sure. Modern research led to the discovery of newer and more valuable medicines; their processing and handling required technique which demanded serious study and hard work. With the 20th century disappearance of the old theory that "if a medicine does good, it can't do harm," we moved out upon a professional plane which continues to hold new and greater challenges out to our resourcefulness and serious-mindedness.

In the realm of our scientific training as well, the past twenty years has watched the development of a standard four-year course of study for pharmacists, leading to a standard Bachelor of Science degree which is in itself a stern measure of scientific accomplishment. The standard has been progressively recognized by graduate colleges everywhere as a basis for post-graduate study, and the pharmaceutical schools have

thus been able to train more students at the graduate level—a highly important development, inasmuch as study at that level is the very basis for continued discovery and development of new medicines and improved techniques, since undergraduate training is devoted solely to the preparation of students for practice.

Yes, our progress has been satisfactory, so satisfactory that we dare not endanger what we have already accomplished, not to mention what we have yet to accomplish, by reducing the quality of our work at a time when new emphasis has been placed upon the need for speed in our professional training.

I note certain danger signs ahead. There currently is a tendency to emphasize the war time acceleration of our educational programs as the important aspect of our own particular war effort. Unquestionably speed is important in view of new demands upon us for trained personnel. But a credit is a credit, and there are only a set number of hours in a quarter or a semester of the academic year. We have worked hard to establish our own credits and hours as indices of achievement, indicative of a standard quality of training as well as a measure of time spent in training. If we are honestly to fulfill our war time obligations, we must automatically observe the spirit of the regulations of our Association as well as our Accrediting Agency, and not just the letter of these regulations. That spirit implies that in our credit and hour symbols the quality is standard, undiminished no matter how grave the emergency. Our war time contribution itself will suffer in direct proportion to variations in the quality of our work, no matter how many more pharmacists we may train this year or next.

We are bound to feel a war time pinch in pharmaceutical enrollment, as well as our teaching personnel. Capable men and women are being drained away from our educational centers to take immediate roles in the armed forces, in government and war time life. But unless we guard constantly against a willingness to sacrifice a little thoroughness here, a little additional individual effort there, the pressure for maintaining or increasing enrollment numbers will play havoc with a type of training which only years of effort have created. At the risk of material reduction in pharmaceutical enrollment, those standards must be maintained. The pinch may be worse than we expect, but in no case should war-created exigencies countenance activities designed to boost enrollments without

complete regard for the high type of professional man and woman we are expected to produce.

The emphasis today is upon quality performance, and our greatest personal contribution to the war lies most certainly along the road of endless high quality training in our students, without regard for enrollment, financial condition, or for the sacrifices and hardships and extra work we individually may be called upon to make as administrators and teachers.

R. A. Kuever

Pharmacy Left Out Again

In World War I, pharmacists were humiliated and embarrassed at the failure of military authorities to give what many believed was merited recognition to graduate registered pharmacists in the armed forces. Physicians, dentists, engineers, and other scientifically trained personnel were commissioned almost 100%, while pharmacists served in all sorts of capacities outside their professional field. Almost none of them were commissioned as pharmacists.

An inventory of the alleged reasons behind this state of affairs brought us to the general conclusion at that time that the schools of pharmacy, with their two or three year courses, were themselves largely to blame. If the schools had not deemed it necessary to give those trained for this age-old health service a standard four-year course in pharmacy, maybe we were wrong in assuming that the military authorities should take pharmacy more seriously than we ourselves had done in training young men and women for the profession. And, so a vow was made that never again could this failure on our part be thrown back on us. As early as 1920, just two years after the Armistice, we found pharmaceutical educators ready to commit themselves to the abandonment of the short course and to the fairly rapid adoption of the three- and four-year course that has now prevailed for almost a decade.

In the interim, however, pharmacy schools throughout the country concentrated their efforts upon getting into their entrance classes the largest number of students possible. Indeed, even then we viewed with general alarm this movement which would inevitably train for pharmacy far more than could possibly be legitimately absorbed in the next generation. The re-

sult—an over-supply of cheap clerks wherever such policies prevailed. This situation resulted in the opening of drug stores in far greater numbers than was necessary for pharmaceutical service, and so hiding behind their pharmaceutical licenses, they became purveyors of a large variety of merchandise in no way related to their pharmaceutical service. The slogan, "Your pharmacist is more than a merchant" was thus contradicted in thousands of so-called drug stores throughout the nation. The druggists themselves knew it, and so did the discriminating public.

Even with the infiltration in pharmacy of six classes since the four year course has become operative, these young men and women work for the most part in stores built around the high pressure salesmanship methods which had resulted from the opening of too many outlets. The cry came for even more pharmacists to man these merchandising emporia that bore practically no resemblance to the health service stations in which real pharmacy is practiced.

And then came World War II. Again, physicians, dentists, engineers, bacteriologists, chemists were eagerly sought for and commissioned as rapidly as they could be examined and inducted. And then followed an amazing innovation. Red Cross nurses were commissioned second lieutenants in large numbers. Despite the fact that only three years of professional training was required for their graduation, they are as a group admitted to military service now with commissioned rank while pharmacists, as a class, have found themselves again almost completely debarred from commissions. Naturally this situation has produced widespread resentment in pharmaceutical circles especially among the younger and well trained men. When our own recent graduates have come to us, we must confess to a feeling of utter inability to help them. The net result of this is that we have set out to seek the reasons behind this unfortunate procedure so far as pharmacy is concerned.

Do the armed services need pharmacists? The answer is plain; yes, and many thousands of them, and on the whole on the same general basis as they are needed in civilian life. Is the training of the graduates of the past few years sufficiently broad and intensive to give them comparable educational standing with graduates in other fields in which group commissions are awarded? As is generally known, the B. S. de-

gree in pharmacy is accepted for graduate work in our best universities, and in our own school is satisfactory for entrance upon the study of medicine. Further, as is well known, freshmen medical students are now commissioned as Ensigns. So the whole situation is an extremely anomalous one.

A few very patent comparisons between pharmacists on the one hand and physicians, dentists and nurses on the other, bring us face to face with certain very fundamental facts. In the first place, American Medicine has an organization that is in every truth its mouthpiece. A large majority of physicians in America are members of this organization and ardently support it. The A. M. A. publishes a journal that is almost a Bible to its members. Physicians attend its annual meetings 5,000 to 10,000 strong. The exhibits at such meetings are wholly scientific. The papers and discussions are highly professional. The A. M. A. has state, city and county societies throughout the nation which are closely allied to it. Their code of ethics binds them fast. The practice of medicine is the life of the physician. Their whole emphasis is professional. Whatever trading of any kind in which they may engage is wholly secondary to their professional service. Physicians outside of their professional societies are looked upon askance. Much the same may be said about dentists and nurses in their respective fields, in their organizations and their ethics. Their services have to do wholly with the welfare of those they are called up to treat. And so these three groups do not have to call themselves professional men and women; the public recognizes them as such, and there is just no argument to it.

An examination of pharmacists by the same criteria brings us face to face with certain rather humiliating facts. In the first place, American Pharmacy has no single voice to speak for them. Some half dozen or more national organizations represent almost as divergent views as if they were in different professions. In the second place, high pressure salesmanship of a variety of merchandise wholly unrelated to the professional needs of the public, constitutes from 50-90% of the total business done in the average stores of the country. In this connection it is distressingly true that the appearance of perhaps a majority of the stores in the country bears no outward testimony whatever to their professional nature. Indeed, all too frequently, whatever of professional work they do is relegated to quarters and kept in a condition of which the

most casual inspection will furnish ample evidence that the professional work is wholly secondary to the trappings and tinsel which receive the major interest of the proprietors.

Membership in the A. Ph. A. is the rare exception among the pharmacists of the country and not the rule at all. Some 4,000 from a total of some 100,000 or more potential members make up the membership of the A. Ph. A. Attendance at the annual meetings rarely reaches 500 retail pharmacists. State meetings of pharmacists are all too largely given up to discussions of sales problems, soda fountains, and other trappings, with perhaps a paper or two on professional subjects thrown in to save face.

A pitifully small effort is made anywhere in pharmacy to demonstrate to the public the real health service value of the neighborhood store, and the professional background and training of its staff. The development of the idea of "pharmacy week" is fundamentally an admission of our failure to sell pharmacy professionally by our daily lives. Little or no professional literature taken or read; prescription departments that are a disgrace measured by any standard of excellence. Looking at this picture—and all of us know that it is all too true—has pharmacy yet reached the stage in its development where we have any justification for expecting certain rights and privileges that you and I crave that some day it will have? Is not the situation in which we find ourselves largely of our own making? Is it not true that until we accept fully and intelligently far more professional responsibilities than there are in many stores today, we shall continue to be passed by when professional preferments are being made?

How many more wars will be necessary to teach us that the cure of this rests with us and not with the military authorities?

To have to say these things is deeply humiliating, but say them somebody must if we are ever to justify fully the change in status that every man among us wants to have, and which we can have if we will do our share toward getting it. Calling ourselves professional men and women will never give pharmacists commissions or professional status. You and I, and all the rest of that 100,000 men and women who call themselves pharmacists have got to contribute more toward bringing about this most worthy objective by living our lives in a pro-

fessionally minded manner. Nothing else is going to do the job. So far, we have not been willing to pay the price; you know it and so do I.

W. F. Rudd
In The Virginia Pharmacist

A Charge to a Graduating Class

Our national founding forefathers believed that our system of government could succeed only as it rested on a firm foundation of education and religion. Our Congress in 1787 declared: "Religion, morality and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged. . . ."

Contrast with this the following pronouncement by Hitler: "Universal education is the most corroding and disintegrating poison that liberalism has ever invented for its own destruction. . . . There must be only one possible education for each class. . . . We must therefore be consistent and allow the great mass of the lowest order the blessings of illiteracy."

For meeting our immediate emergency in world relationships we must unitedly support the war program with all its emphasis on arms and munitions. But in the long run, for solution of grave problems of readustment of life and work after the clash of arms has ceased, our greatest hope is to be found in the institutions in which the founders placed their hope—the school and the church.

The real issue in this war is whether what is good in human nature or what is bad shall rule the world. Hence we must cherish more dearly and we must cultivate more seriously the spiritual phases of human life. Only in the democracies are universities still free to function in the true spirit of a university. The dictators have not learned that you cannot destroy ideas by force, and you cannot hide them by silence.

Though the dictators have decreed an end of Christianity in their domains and have substituted a pagan worship of brute force, we shall remind ourselves constantly that the essence of the greatest, the essential law is the law of love found in the two great commandments—Thou shalt love the Lord thy God, and Thou shalt love thy neighbor as thyself; the essence of right conduct is found in the Golden Rule; the essence of prayer is found in the Lord's Prayer; the essence of theology is found in the picture of God the Father; and the essence of the social ideal is found in the vision of the Kingdom of Heaven among men.

C. S. Boucher
Chancellor

The University of Nebraska
May 25, 1942.

The Editor's Page

"Pharmacy; The Functional Significance of an Institutional Pattern" (see first article in this number) by Isador Thorner is, as the author himself states, a study which attempts to show the relationship beween an institutionalized ethical code and the function of that profession. In a letter to the editor in which the author grants permission to republish the article (see Gleanings from the Editor's Mail), he states that this study is a part of a larger study which will constitute a doctoral thesis for the department of sociology of Harvard University. For his further study Mr. Thorner seeks the aid of colleges of pharmacy in supplying him with data relative to the high school scholastic achievements and intellectual ability of pharmacy students as compared with those in the liberal arts college of the same institution. Other information desired is the students earnings while in the school of pharmacy, their parents, country of birth, religious denomination, occupation and income level. Anyone who can render any service to Mr. Thorner will also render a valuable service to the solution of our own educational problems. It should give our profession satisfaction for a sociologist to choose it as a basis for a sociological study just as it did when Dr. W. W. Charters in 1925 chose it as a basis for the application of his functional technique which resulted in the publication of "The Basic Material for a Pharmaceutical Curriculum"—a study which has had a profound effect upon pharmaceutical education. Sociologists like pharmacists speak a language all their own. Dr. George Urdang has done us a service by following Mr. Thorner's article with a commentary that is most helpful.

An unfortunate circumstance is the vacillating policy which has been followed concerning the annual meeting of the American Association of Colleges of Pharmacy at Denver. The place of this meeting was fixed two years ago at Richmond by vote of the allied pharmaceutical associations and since that date, plans have been made for it. The annual meeting is made mandatory by the constitution. Whether it is within the power of the officers or of the Executive Committee of the Association to postpone a meeting or eliminate it altogether may be a debatable question. If it is a legal procedure, it makes it possible for the tail to wag the dog. But grant that it is legal,

the question remains as to whether it is good policy to agitate the problem by sending out questionnaires two months before the meeting and creating uncertainty as to the meeting. Such uncertainty produces confusion and makes program building more difficult and endangers attendance. When compared to what the medical men did, our action was pathetic. If there was any thought of the medical men abandoning their annual meeting at Atlantic City, the report never got to the Nebraska side of the Missouri river. The medical men evdiently realized the importance of their profession and the seriousness of their tasks in the time of war, otherwise there would not have been eight thousand of them registered at their convention. In comparison with that, it is not to the credit of pharmacy to even have thought of abandoning the national convention in time of war when we have so much at stake. Now is the time for pharmacy to stress the service she can render to the armed forces and to civilian life. Now is the time with the menace of acceleration a reality, with the Army giving courses in pharmacy to unqualified students by unqualified instructors, with the question of credit for experience for training in the Army facing our licensing boards, with the tremendous educational and economic problems facing us in the post war period, now is the time of all times for us to meet in conference and give these problems the best thought of which we are capable. Attention has been called to the fact that the American Association for the Advancement of Science cancelled the June meeting at Ann Arbor, but that is quite a different thing. The American Association for the Advancement of Science is a correlating and a coordinating association and it does not have an educational program to defend and maintain and develop that so intimately affect the lives and welfare of our people as does pharmacy. Furthermore, President Ruthven of the University of Michigan announced that the meeting had to be abandoned because the possible meeting plaecs were used for war work. But there will be no such difficulty in Denver. If there is no hotel space, within an hour's drive there are a thousand mountain peaks with natural amphitheaters on the slopes of each and nearby an overhanging ledge of granite or a cozy cave where one may find refuge in the time of storm.

In the Virginia Pharmacist (reproduced Editorial page), under the title "Pharmacy Left Out Again," Dean W. F. Rudd

discusses and analyzes with his characteristic clarity the present position of pharmacy in the armed forces. In the May 2, 1942, issue of the Chemist and Druggist, under the title "Observations on the Future of Pharmacy" a Mr. E. M. Williams discusses the problems of pharmacy in the British Empire in much the same tone. While Dean Rudd has pointed out the weaknesses of American pharmacy and called attention to our shortcomings and tells us what we must do in order to get the recognition we want in the Army, every word of which is so, he leaves us in the slough of despond without that ray of hope that we need to inspire us and drive us on to obtain the objective we long for and which in the end we will obtain. That inspiration is to be found in the history of pharmaceutical education since the turn of the century. In fact, it is only necessary to go back to World War I to remind ourselves of a few major changes. Compare the requirements for the study of pharmacy today with those of 1917. Compare the curriculum of that day with the present one. Compare the work being done on the graduate level of the two periods. Compare the investment in educational institutions for the purpose of pharmaceutical teaching. Compare the interest and the support of pharmaceutical education by the tax paying public. Note the recognition given pharmacy by honorary scholarship societies, by national scientific and educational organizations and institutions. Note the advancement in pharmaceutical legislation designed for the betterment of public welfare. Note the interest everywhere which pharmacists are taking in community life, in better government, in art, in general education, in history as manifested by the establishment of the American Institute of the History of Pharmacy. Note that pharmacy has been studied by the educator to prove the value of his methods and is now being studied by the sociologists to determine what an institutionalized code of ethics will do to a profession which is attempting to put it into practice in order to increase the dignity and the usefulness of its service. It is true that pharmacy as a whole does not have that solidarity that medicine does through its organization. Someone has said that the service a profession gives may be measured by the support which those who practice it give its organizations. (We suggest that this is broad enough to include the support of its conventions in war time.) Pharmacy has many aspects and it is essential that these different aspects foster their own

organizations, yet the fact is true that pharmacy is rapidly becoming organized on a state level through local, county and state organizations, and in a national way through the cooperative efforts of many of our national organizations. It is not too much to expect, that in the not too distant future, we will find pharmacy a national unit. When that time comes, pharmacy like medicine will have the ear of the politicians. And that is what it takes as much as we dislike to say it to get recognition in some places. Again, we say it is history that gives us the background for our present status and gives us the guidepost for future progress. Dean Rudd is right when he infers that the most potent factor in obtaining our objective is the living of our lives in a professionally-minded manner.

On May 11, at an annual dinner which Mr. Arthur Raymond of the Lincoln Drug Company, gives to the faculty and the graduating class of the college of pharmacy of the University of Nebraska, Mr. Raymond presented the school a check for $1,000 to be used for the college as the faculty deems most wise. It will be used for the development of graduate work. A few days later word was received by the dental school and the medical school of the same institution, that each unit had been granted the sum of $10,000 by the Kellogg Foundation, $8,000 of each gift to be used as a loan fund for needy students and $2,000 for the establishment of scholarships in medicine and dentistry. From the size of the gifts, one unacquainted with the circumstances might think the gift to pharmacy was small in comparison, but in reality it is not so. For with Mr. Raymond's gift went a personal good will, an expression of confidence in the worth of his own institution and his own profession, that means much more to the institution that received the gift, than the actual amount of money given. From time to time in these pages attention has been called to the fact that the other professions have been helped by the great foundations and by men of wealth, many of them having made their wealth in the drug industry. But pharmacy has done and is doing for herself what other professions have had done for them by outside agencies. The writer is reminded of a missionary friend of his in China, who at one time held a professional position on the staff of the department of chemistry of the University of Nebraska. When he became a resident of China, he had servants supplied him for every menial task,

but he refused to let the servants polish his shoes. He declared he had to reserve something to do for himself to preserve his self respect. And so it is we can take great pride in pharmacy for doing our own tasks and Mr. Raymond has done more for us than he dreamed when by his handsome gift he placed confidence in his home folks and gave the writer the greatest thrill of his thirty-eight years of service.

The menace of "acceleration" to pharmacy—Sometimes it is enlightening to get the students' point of view. Last week end there breezed into my office two medical students, each with a Phi Beta Kappa key dangling from his watch chain, shouting "We are washed out, we want the Tetons." After nine months of grueling work in the medical school, they were now in the middle of the first period of acceleration. They were right, they should now be in the Tetons; if not the Tetons, the harvest field would be a good substitute. They said their medical teachers were also washed out. Their teaching had degenerated into throwing a mass of technical material at the student with the suggestion that he do the best job possible at salvaging it. Such is the spiritual status of student and faculty before the first round of acceleration is over. What will be the status at the end of three years and three months of acceleration? The expression of these students is the answer to the oft repeated statement coming from our pharmacy schools that acceleration is being accomplished without any impairment in teaching. It should also remind us that the standard educational policy requiring a vacation period of considerable length between sessions, is a biological necessity. We better begin to plan now on how we can save face before the cram schools after the duration.

A recent edition of the Washington Post carries the story of the death of a prominent clergyman who was also chaplain of the Senate of the United States. The death was due to dilaudid poisoning which was the result of an error in compounding by a man who had practiced pharmacy for 60 years and is recognized and respected as one of the outstanding pharmacists in America. It seems that the error was made in the conversion of the apothecary into the metric system. This conversion was made from a Pharmacopoeial table and the procedure was checked three times for accuracy. In spite of this

fact, the patient got approximately 1/32 of a gram instead of 1/32 of a grain. The coroner's jury described the error as "accidental" and exonerated the pharmacist of criminal responsibility for the death. Those of us who know this pharmacist intimately, realize the justice of the verdict. Nevertheless, this is another case which illustrates the seriousness of the pharmacist's work. Such incidents prove that if we grant as true, what many druggists insist, that pharmacy has been reduced to the pouring of the contents of one bottle into another (which of course it is not), pharmaceutical manipulation is still a serious business. It also raises the question as to whether a druggist is ever justified in using a conversion table in dispensing potent drugs? If grain weights had been used in compounding this prescription, or if the pharmacist had worked out the conversion in his own mind, it seems as if it would not have been impossible to have made this error.

Dr. W. W. Charters rendered a great service to pharmacy when he conducted the Commonwealth Study of the function of the pharmacist back in the middle twenties. On the occasion of his retirement from active services the editor wrote him a letter, which he believes expresses not only his own opinion of Dr. Charters' service, but of all of those who worked with him and those that have been benefited by his service as well, and that includes everyone engaged in any phase of pharmaceutical service. The letter follows:

Dr. W. W. Charters
Bureau of Educational Research
Ohio State University
Columbus, Ohio
Dear Doctor Charters:

Word has come to me through Mr. T. C. Holy, that your retirement is no longer "Lost in the mists of antiquity," and that your colleagues are to honor you by a program and dinner on the sixth of June for your long and distinguished services in the many different fields of endeavor. It is needless to say that I regret I cannot be there. The days are not long enough to complete the work that the emergency has placed upon us. I cannot let this day pass, however, without expressing to you my gratitude for the services that you have rendered to pharmaceutical education and practice, by making possible and directing the Commonwealth Study of Pharmacy back in the twenties. This study has furnished the basis for our whole pharmaceutical educational program that has been responsible for placing everything pharmaceutical on a higher educational and professional plane. It must give you a great deal of satisfaction to know that you have rendered such a service to one of our most important public health professions.

May the years ahead of you be many in order that you may further see and enjoy the benefits which have come to society because of your activities in many fields.

Most sincerely yours,
Rufus A. Lyman,
University of Nebraska.

May 11, 1942.

Again a great university has honored a great pharmacist and by so doing has honored the profession he represents. The fact that this honor came to Dr. Robert P. Fischelis from the state university of his own state adds to the significance of the act, for great pharmacists like great prophets are not without honor except in their own countries. One can feel a great sense of satisfaction when he receives honors from the home folks. When President Clothier of Rutgers University conferred a degree upon Dr. Fischelis, he read the following citation which is pregnant with truth:

"Robert Philipp Fischelis

"Outstanding leader in your professional field, you have made notable contributions which have greatly strengthened the essential service which the science of pharmacy renders to the health of America. As editor and author you have helped greatly to make known to others the latest findings of pharmaceutical science. Today you are devoting your talents and your wealth of experience to the service of our nation as she strives for survival and for the preservation of freedom.

"In recognition of your long and rich service to the pharmaceutical profession and in acknowledgment of your devotion to your country's cause, I confer upon you, honoris causa, the degree of Doctor of Science."

There is no reason why audio-visual education should not be made to contribute something very much worthwhile to pharmaceutical education as it has in so many other lines. We are fortunate in having Prof. Edward S. Brady II of the University of Southern California so related to the Poulson Films of Los Angeles that they have undertaken the filming of certain pharmaceutical techniques. It is true, of course, that such films cannot take the place of processes in the laboratory which the student must go through with his own hands any more than a film showing a surgical procedure can replace the actual operation in the hands of the medical student, and yet one does not have to debate the value of moving pictures as an adjunct to any kind of professional training. Its value is evident. Such films will also have great value in educating the public as to the nature of pharmaceutical training.

Interest in drug plant culture is again in the ascendancy. That interest was born in the first world war when our supply of such vital drugs as belladonna and digitalis were placed on the first contraband of war by the warring nations. This interest was intensified by the fact that many of our native drug plants were unobtainable because of their ruthless destruction in their native habitats. The use of the drug plant garden in those days was largely for propaganda purposes, but it did serve a useful purpose as an outdoor laboratory for the study of pharmacognosy. But comparatively little has been done to develop a commercial drug plant industry in this country. Dr. H. A. Langenhan, formerly of the University of Washington and for many years in charge of the S. P. Penick & Company, Skagit Valley Drug Plant Farms in the state of Washington, has had a wide experience in making commercial drug plant culture a success. At the request of the editor, he tells us in this issue what the basic factors are for making the culture of medicinal botanicals a commercial success.

The editor is very sympathetic with Prof. Leslie B. Barrett of the University of Connecticut when he is irritated by the repeated defense for the inclusion of pharmacognosy in the pharmaceutical curriculum. The editor has spent a large amount of time trying to get the other biological sciences into the curriculum. We seem to have reached a point now where they are accepted as an essential. Pharmacognosy is the oldest of the biological sciences in the pharmaceutical curriculum. The factor that has brought it to the forefront in our thinking is the fact that retail druggists and especially board members in the last year have directed a barrage of criticism against it and in my own district some board members would have abandoned the subject in their examinations had it not been required by their state law and it was easier to continue giving the examination and also less hazardous than to change the law. A few years ago when the secretary of the American Pharmaceutical Association offered the American Association of Colleges of Pharmacy a page in each issue of the Practical Edition of the Journal of the American Pharmaceutical Association, I conceived the idea that an educational campaign for the support of pharmacognosy was in order. I asked a dozen pharmacognosists to contribute to that idea. They did so generously. Then the Practical Edition discontinued the policy.

These articles were convincing to the writer that pharmacognosy is as essential to the pharmaceutical curriculum as bacteriology is to medicine. The fact that diphtheria antitoxin will never be made by the doctor in his office is no justification for dropping bacteriology from the medical curriculum, neither is the fact that a druggist may never see a digitalis leaf in his drug store a justification for dropping pharmacognosy from the pharmaceutical curriculum. As a matter of fact, the introduction of the other biological sciences into the curriculum and the prospect of developing a drug plant industry has made the necessity of stressing more than ever the subject of pharmacognosy in our course of study, not only in its structural aspects, but its physiological aspects as well. Pharmacognosy is to the biological sciences what anatomy is to physiology. We are not attempting to defend pharmacognosy, we are carrying on a much needed campaign of education and we all need it from college instructor to retail druggist if we are to maintain the objectives of pharmaceutical education.

The last few months has seen the passing of a number of men who have given distinguished service to pharmacy. Dr. Washington H. Zeigler, dean of the School of Pharmacy of the State of South Carolina, served this Association in many capacities, a man with a heart of pure gold, and all the other human characteristics that make a southern gentleman a lovable character; Dr. Charles E. Caspari, dean of the St. Louis College of Pharmacy, scion of an illustrious pharmaceutical stock, a great warrior, courteous alike to friend and foe and respected and loved by both; Wilbur L. Scoville, chief of the analytical department of Parke Davis and Company, a profound investigator and student of the pharmaceutical sciences, editor, author, and at all times a distinguished and inspiring teacher whose services as such will not end with his passing; Dr. Eugene G. Eberle, teacher, administrator, a life time editor, and for a third of a century the editor of the Journal of the American Pharmaceutical Association, keen of mind and a gentle personality, and the wielder of a pen which has been one of the most powerful influences for the advancement of pharmacy in our time. I am grateful that it has been my lot to know and be permitted to share in the discouragements and the accomplishments of such men.

Rufus A. Lyman

Gleanings from the Editor's Mail

I am returning herewith the proofs of the little paper, "The Evaluation of Drugs by Biological Methods," which you have kindly accepted for publication in your journal.

Please let me congratulate you on the excellency of these galley sheets; with but one exception, all of the corrections made represent my own mistakes. I do not believe I have ever received a proof so nearly perfect.

H. B. HAAG, M. D.
Medical College of Virginia

June 30, 1942

Thank you for your letter of May 27. Your judgment as to the interest the article would have for pharmaceutical educators is quite gratifying to the author as a sociologist. Permission to publish is naturally freely granted.

Permit me to grasp this opportunity to address a request to you. It is possible that you may have access to information concerning pharmacy students which thus far has eluded me for the most part. I would like to secure data for over a long period and as many colleges of pharmacy as possible, on their students' high school scholastic achievement records or other evidence of intellectual ability, together with similar data for the students of liberal arts colleges with which some of them are affiliated. Other useful data would include the students' earnings while at pharmacy school, their parents' country of birth, religious denomination, occupation and income level.

My interest in the collection of this material is due to its use in the preparation of a doctoral thesis for the sociology department in Harvard University. The article in Social Forces is the result of work done for a paper there while engaged in postgraduate study and will be incorporated in the finished thesis.

ISADOR THORNER,
12 Walker St.,
Cambridge, Mass.

May 30, 1942

Why do we have to justify the inclusion of pharmacognosy in our curriculum? This is the question that jumps at me every time I read something about why pharmacognosy is important to the pharmacist, or why the course is given in a college of pharmacy, or how a pharmacist may use his knowledge of pharmacognosy—and there have been a number of such contributions in the Journal. This is by no means in criticism of Dr. Goodrich, for whom I have the greatest respect, for his contribution in the April issue of the Journal, but those both in the colleges and outside who look upon pharmacognosy as a necessary evil.

I teach pharmacognosy, and do so without apology. It is a subject as old as pharmacy itself, and as long as there is a plant drug handled; as long as fluidextracts, tinctures, and other galenicals are found on the shelves of a pharmacy; and as long as the active ingredients of plant drugs enter into medicinal preparations, just so long will there be pharmacognosy whether some moderns like it or not.

LESLIE B. BARRETT,
University of Connecticut.

June 23, 1942.

Pharmaceutical Education on the March

University of Connecticut, College of Pharmacy.—Through the Beatrice Fox Auerbach Foundation of Hartford four full freshman scholarships have been established to residents of the state and at least one of the recipients must be from Greater Hartford and one must be a woman.—The Traveling Men's Auxiliary of the Connecticut Pharmaceutical Association has also established a freshman scholarship which is open to a graduate of a high school in this state.

Creighton University, College of Pharmacy.—Since July 1, 1941, one hundred and sixty-two volumes have been added to the pharmacy library.

Detroit Institute of Technology, College of Pharmacy.—Many new books have been added to the library by purchase and through gifts. Mr. Earnest Jones, former dean, gave several volumes.—A course in drug store management, one in accounting, and one in pharmaceutical problems will be given next fall.—New equipment includes surface tension apparatus and a three unit electric combustion furnace.—Professional promotion was carried out through the "open house" method. Two thousand visitors attended.

University of Florida, School of Pharmacy.—The General Education Board has donated the sum of $20,000 to the University of Florida for the purchase of sets of periodicals. A portion of this sum will be allotted to the School of Pharmacy.—Mr. Joseph M. Bransky, acting superior of narcotics at Atlanta, has presented two rare volumes of the Druggist Circular to the library.—A number of valuable books and research notes on drug plant cultivation have been donated by Dr. S. C. Hood of Westfield, Massachusetts.—The late Mrs. Edith Ramsaur bequeathed the University the sum of $750, the income from which is to be used to continue the D. W. Ramsaur medal for scholarship.—The Board of Pharmacy has given the sum of $5,000 to continue the work of the Bureau of Professional Relations during the year 1942-43.

University of Georgia, School of Pharmacy.—During the past year the Advisory Faculty Council of the University Center in Georgia awarded to the school of pharmacy a grant in pharmaceutical chemistry for the purpose of preparing and studying some potential analgesics. A second grant from the American Pharmaceutical Association is making possible during the present summer some investigations in the problems connected with the methods of purification and physical properties of the official oils of turpentine.—Through purchases, exchanges and gifts the number of volumes in the pharmacy library has been increased, especially with respect to bound copies of the standard pharmaceutical journals published in the United States.—Laboratory equipment for research in pharmaceutical chemistry and pharmacology has been purchased and installed.—The courses in pharmacognosy and pharmacology have been revised and augmented. One five-hour course in pharmacognosy is now offered in the junior college division and another three-hour course in the senior college. The work in pharmacology is divided into three three-hour courses all of which are offered in the senior college. These three courses in pharmacology are followed by two three-hour courses in biological products and toxicology respectively. A new course

in drug assaying is offered in the division of pharmaceutical chemistry. A separate course in pharmaceutical jurisprudence also becomes a part of the curriculum for the first time.

University of Idaho, College of Pharmacy.—The $175,000 building to house the college of pharmacy on the Pocatello campus was dedicated on June 8. The chief speaker was Governor Chase A. Clark. Theodore Christenson, former governor of Minnesota and chairman of the Public Relations Council of the National Association of Retail Druggists had a part in the program. The building is a 119 by 222 feet, two story structure, built of cream colored brick and dominating the southwestern corner of the campus. It contains 13 laboratories, 3 classrooms, a library and study room. The Idaho Board of Pharmacy has been assigned a room for its own special use in the building.

University of Illinois, College of Pharmacy.—The Board of Trustees of the University have just given the faculty of the College of Pharmacy authority to establish a curriculum leading to the degree of Doctor of Philosophy in the fields of pharmacy, pharmacognosy, and pharmaceutical chemistry. In anticipation of the need for graduate students trained in the field of pharmacy and related subjects, ten students have been enrolled in the graduate program of the College of Medicine during the past year. Six of them are now enrolled for graduate work in the summer session.—Dr. Edwin L. Smith, B.Sc. in Pharmacy, M.S., University of Nebraska, Ph.D., University of Chicago, has been appointed to the staff of the department of pharmacology.

University of Minnesota, College of Pharmacy.—Two $725 Samuel W. Melendy graduate fellowships and seven $150 undergraduate scholarships have been made available for the coming year.—The time allotted to the course in pharmaceutical calculations has been increased by 2 hours per week; an additional hour will be allowed the courses in pharmaceutical jurisprudence and pharmaceutical preparations, and 3 hours per week has been added to the course in pharmacology to provide time for laboratory work.

The University of Nebraska, College of Pharmacy.—Mr. Arthur Raymond, president of the Lincoln Drug Company, presented a check for $1,000 to the College for the purpose of improving the graduate work.—A course in pharmaceutical history will be instituted the coming year under the guidance of Dr. Michael Ginsburg, whose researches on the social policies of the Roman Empire led him into the field of the public health service of the classical world. A part of this study was published in the January 1942 number of this journal. Dr. Ginsburg will also develop advanced and research courses in the historical pharmacy field.—Grants during the year have been made by the Ciba Company and the Penick Company for digitalis studies; by the A.Ph.A. and the Nebraska Academy of Science for studies on the action of sclerosing drugs; by the National Research Council for the study of shock, and by the Breon Manufacturing Company of Kansas City, for study of the effects of sex on drug action.—Additional permanent equipment include an artificial respiration pump, a constant temperature water bath, and a Fisher-

Davidson gravitometer.—200 additional volumes have been added to the pharmaceutical library.

Ohio State University, College of Pharmacy.—The laboratory for graduate work has been improved by the addition of a new three-section table. One section is equipped with a built-in animal board and drain suitable for carrying on animal experimentation.—The alumni development fund and the graduate school have provided the necessary funds for the purchase of a drug mill and power shaker which makes it possible for the students to prepare their own powdered drugs for laboratory and research purposes.—Courses in the principles of biologicals and in endocrinology are now required of students for a degree.—The graduate school is now in a position to give work leading to the doctor's degree. Five students were regularly enrolled during the past quarter.—A Eureka tablet press has been installed in the manufacturing laboratory. —The cooperative Purnell project subsidized with federal funds has been established between the college of pharmacy and the department of floriculture. It deals with the experimental production of medicinal plants. The college of veterinary medicine is also engaged in this program, rendering valuable service from the standpoint of the clinical applications of these plants to veterinary practice. Directors of the project include Dr. Alex Laurie—floriculture, Dr. Derwin Ashcraft—veterinary medicine, and Dr. L. David Hiner—pharmacy. Under the plan each college or department receives one graduate assistant and funds for equipment and supplies. Mr. Willis Brewer of South Dakota State College, Division of Pharmacy, will supply the assistance from this college, Mr. Stilling from floriculture, and Dr. Baker from veterinary medicine. Active work is already under way with the plants set into the field and the graduate assistants active at the work.

Oregon State College, School of Pharmacy.—Included in new apparatus recently installed, is a refrigerator for the storage of biologicals. —The department of pharmacology has acquired a portable and convertable two section animal cage suitable for class room demonstration or for the permanent housing of animals. The equipment was made in the college shops.

South Dakota State College, Division of Pharmacy.—The South Dakota Board of Pharmacy and the South Dakota Pharmaceutical Association have established a $75.00 scholarship for worthy freshmen pharmacy students from the state of South Dakota.

State College of Washington, College of Pharmacy.—The new S. B. Penick fellowship in pharmacy of $900 was awarded to Morris Wolfred. This fellowship was given in conjunction with the cooperative study being carried on by the school with the S. B. Penick Company concerning the cultivation of Belladonna in eastern Washington.—Two new courses for graduate students have been given this past year. One considered the identification of organic medicinals by the analysis of the elements present and the other was an advanced study of the synthesis of organic medicinals.—New equipment purchased included torsion balances for the dispensing laboratory, a Parr catalytic hydrogenation apparatus, a Dumas nitrogen apparatus, catalytic combustion apparatus and a microvoltmeter and titrimeter.—Five scholarships for undergraduate students

have been established by various branches of the Women's Auxiliary of the Washington State Pharmaceutical Association.

University of Washington, College of Pharmacy.—An Upjohn research fellowship has been established in the department of pharmacology for research on the barbiturates. This coming year it will be held by Helen Kipple.—Members of the staff are working with the National Farm Chemurgic Council on the promotion of economic and medicinal plants in the northwest. For a number of years this college has maintained an extensive drug garden in which several hundred plants of commercial interest are being grown. Because many drug plants grow so well in this locality, an experimental tract of about six thousand square feet has been established. Several students particularly interested in pharmacognosy have taken part in the development of this tract and have worked from the time the ground was plowed until the seeds were planted. Although it is too early to predict the success and results of the work, it promises to be a very worthwhile project. The plants under development are the castor bean, coriander, Ramie, safflower, and the Russian sunflower. In collaboration with the Council, the college has distributed a considerable number of these seeds to various individuals. It is hoped that data may be obtained from these different individuals and a comprehensive report prepared this fall.

Western Reserve University, School of Pharmacy.—A more logical sequence of courses has been made by requiring organic chemistry a prerequisite for pharmacognosy.

George Washington University, School of Pharmacy.—Dr. Louis F. Bradley, Secretary of the District of Columbia board of pharmacy, was the speaker at the annual banquet of the Mortor and Pestle Society on May 29.—Prizes for scholarship were awarded as follows: the James Douglas Goddard prize, Donald W. Smith; the Merck awards, Silas H. Pearson and George A. Gibbs.—Frank Fortunato is engaged in graduate study in pharmacology at the University of Maryland School of Medicine during the summer.—The Women's Auxiliary of the D. C. Pharmaceutical Association has again contributed $100 for reference books for the library.—One additional office and research laboratory has been provided.

University of Montana, School of Pharmacy.—Sister Rose of Providence Ginder, Vivian Beth Medlin, and Sister Prudentia Neven were graduated "with honor."—The Lehn and Fink medal went to Sister Neven and the Merck awards to Sister Rose of Providence Ginder and Russell K. Anderson.

Philadelphia College of Pharmacy and Science.—Dr. George W. Patterson has been chosen president of the Alumni Association for the ensuing year.—Dr. J. I. Feinman has been appointed a member of the teaching staff in pharmacology to take the place of Dr. E. A. Mullen, now on leave serving as Commander in the United States Navy.—More than 300 students of the upper classes returned in June for the accelerated program.

Notes and News

The University of Buffalo.—Honors and prizes awarded at commencement were: Lehn and Fink medal and the Grand Council, Kappa Psi key, Joseph L. Cannizzaro; the Buffalo Academy of Pharmacy prize, Robert E. Jones; the Gamma Chapter, Kappa Psi key, E. Willard Brinkel, Jr.; the Rho Pi Phi key, Orville C. Baxter; the Merck awards, Joseph L. Cannizzaro and Orville C. Baxter; the New York State Pharmaceutical Association prize, Charles D. Ross. Joseph L. Cannizzaro and Robert E. Jones were graduated "cum laude."

University of Colorado.—Joseph P. LaRocca, 1942, has accepted an N. F. scholarship at the University of North Carolina College of Pharmacy for the coming year.—Bernard J. Stock, assistant in food, drug, and sanitary chemistry, who received the master's degree in June, has accepted a position with Cutter Laboratories, Berkley, California.—Twenty-five graduates of the College of Pharmacy are now serving with the armed forces of the United States.—The annual banquet was held on May 8. The Colorado state board of pharmacy and their wives were guests. Alumni attendance was the largest in history. Awards for scholarship given on this occasion were: Lehn and Fink medal, Paul G. Taddiken; The Rx Club medal, Olive Gloria Gillespie; the Merck awards, Glenn Hill Cooper and Olive Gloria Gillespie; the Phi Delta Chi medal, John A. Biles.

Columbia University.—Dr. Howard Levi, lecturer in mathematics, has been appointed instructor in mathematics, Aeronautical Division, U. S. Navy and Mr. R. Schatten has been made his successor.—Prof. Harry Taub has been appointed Chief Chemist, Bureau of Food and Drugs, Health Department, New York City.—The Edward Pfeiffer memorial scholarships, six in number and valued at $100 each, will be offered to students entering in September. These scholarships will be awarded on the basis of fitness for pharmacy, scholarship record and need for assistance on the part of the applicants.—The University Council has approved proposals to accelerate the studies of the senior and junior years. Plans for the senior acceleration have been completed and one section of this class will complete the first semester between June 8 and August 28. The second semester will be completed January 15, 1943 and the Council has authorized conferring of degrees as of this date so that graduates may participate in the licensing examination. A second section of the senior class will complete their studies under the normal program and graduate in June 1943. Junior class acceleration is contingent upon governmental action regarding use of the college facilities for training of a defense force unit during the summer.—Profs. Hart, A. Taub, Lascoff, Liberman, Pokorny and Blumberg have been designated as instructors in air raid procedures under the Civilian Defense organization.—Senior awards and prizes for scholarship were presented at commencement as follows: Bigelow fellowship and Alumni medal, Abraham Silbergleit; Plant fellowship, Hyman Ginsberg; Breitenbach award, Alumni silver medal and Dickman prize, Erich Kramer; Alumni bronze medal and Kappa Psi prize, Julius Rotkowitz; Lehn and Fink medal, Kenneth Bolnick; Leiterman medal, Lamda Kappa Sigma key and

Women's Club award, Myrtle Sandmann; New York State Pharmaceutical Association prize, Stanley Greenwald; Olansky medal, Saul Zuker. The Junior awards, the Seabury scholarship and the Dohme prize, Leon Rand. The Sophomore awards were Italian Pharmaceutical Association medal, Bernard Cohen; Squibb prize, Norbert Meyers.

University of Connecticut.—New members elected to Rho Chi are: Jack Blodinger, Arthur Smithwick, Alton Austin, Edward Burt, Frederick Casioppo and Carmelo Vasquez.—John S. Rosengren has been appointed a graduate assistant in pharmacy, Western Reserve.—Thomas R. Robinson, public defender in the Superior Court, New Haven, has been appointed instructor in pharmaceutical jurisprudence, filling a vacancy made by Lieut. Comdr. Robert H. Alcorn, who is on leave on active duty in the United States Naval Reserve.—Dr. A. M. Nagler, formerly of Marymount College, is a new instructor in German and Mr. William J. Strange, A.M., Syracuse University, will teach mathematics.—The commencement exercises, the first since the school became a part of the University, was held at Storrs. Governor Robert A. Hurley presided and President Jorgensen gave the commencement address. His subject was "The Authority of the Liberated Yet Disciplined Mind." There were thirty-five graduates in pharmacy. The dedication of seven new buildings was a part of the program.—High honors in the pharmacy class went to John S. Rosengren, Arthur Smithwick and Harold Hersh.—The Trustees scholarship went to Frederic Casioppo; the Huber scholarship, Alton Austin.—Dean Henry S. Johnson was the winner of a $50 War Bond and a set of the Encyclopoedia Britannica for "stumping" the experts on a recent "Information Please" program.—An accelerated program was begun on June 8, for the three upper classes, but no freshmen will be admitted until September.

Creighton University, College of Pharmacy.—Prizes for outstanding scholarship: the Whaley prize, Raphael O. Bachmann; the Connolly prize, Anthony P. Becker; the Severin Walter prize, Edwin L. Becker; the University prize, Roderick E. Ault and Amos J. Bohnenkamp; the Lee prize, Daniel S. Roccaforte; the Agnes Leahy Sutherland prize, John W. Mishler; the Rush prize, Howard Devine; the Merck awards, Raphael O. Bachmann and Jack Lee; the Lehn and Fink medal, Raphael O. Bachmann, and the Jarrett prize, John A. Johnson.—Officers of Rho Chi for 1942-43; John W. Mishler, president; C. H. Sprague, vice president and delegate to the national convention; F. V. Potrepka, convention alternate, and S. C. Pirruccello, secretary-treasurer.

Detroit Institute of Technology.—Earl Casden, senior, won a war bond offered as a prize for papers presented before the Michigan Branch of the A.Ph.A. at the annual student meeting.—The school has gone on the trimester basis of instruction during the present emergency and is offering a full semester's work during the summer session.—Awards for scholarship were: the Stout medal, William Forster; Kappa Psi award, James Rowe; Bialk award, William Forster; Pharmacon Club award, Frank Wojack; Merck awards, Earl Casden and Max Victor; Freshman scholarship award, William Pasman.

Duquesne University.—An accelerated program was begun on June 8. Freshmen will be received in September as usual.—Salvatore J.

Greco, B.Sc., 1942, has been granted an assistantship in the University of Maryland.—Stanley P. Porter, an instructor in chemistry, will enter the graduate school, University of Florida, in August.—Prizes for scholarship were awarded at commencement as follows: Pharmaceutical Association prize, Alvin Laibman; the Kreuer prize, Patrick F. Belcastro; the Muldoon prize, Salvatore J. Greco; The Voss prize, William B. Montgomery; the Merck awards, Salvatore J. Greco and Patrick F. Belcastro; the Lehn and Fink medal, Salvatore J. Greco.

University of Florida.—Dr. Herman C. Shuptrine, chief of the manufacturing division of the Tampa Drug Company, spoke before the pharmacy students in April.—Dr. George M. Hocking, whose work for the doctorate was done on peppermint, has been elected a member of Sigma Xi.—Arthur G. Zupko and Regina L. Buzzett were graduated with high honors. The following prizes were presented for excellence in scholarship: the Ramsaur medal, Regina L. Buzzett; the Lehn and Fink medal, Arthur G. Zupko; the Attwood Pharmacy Leadership award, Frank A. Duckworth, Jr.; the William Emrich prize, Jack K. Dale; the Merck awards, June Louise Pert and Ellbert C. Jackson, Jr.; the Bransky prize, Burton M. Bishop.—Each member of the graduating class received gifts from Eli Lilly and Company, Merck and Company, and a copy of the Code of Ethics of the American Pharmaceutical Association from Rho Chi.

Fordham University, College of Pharmacy.—Dean Major James H. Kidder, who enlisted in the Service May 1, 1941, is now somewhere in Australia.—During the past year over one thousand alumni and students took the Red Cross courses in first aid.—Several faculty members acted as instructors for the O.C.D. during the past year.—An accelerated course for seniors was begun on June 22 and will end in mid-January. The accelerated course for all other classes including seniors unable to attend school during the summer will begin September 1 and it will eliminate most holidays and extend into mid-April of 1943.—Dr. Otto F. A. Canis has been appointed chairman of the Pharmacy Advisory Committee to the Department of Welfare of the city of New York.—A daughter of Dr. Canis was graduated in June from Beaver College, Jenkintown, Pennsylvania with a major in history. She expects to enter the field of teaching.—Donald P. Donahue has been appointed registrar.—Thirty students were graduated on June 10, two of them, Sister Mary Vera Rourke and John P. Lombardi, with magna cum laude.—Prizes for scholarship have been awarded as follows: Bronx County Pharmaceutical Association medal and the German Apothecaries' Society medal, Sister Mary Vera Rourke; the Alumni medal, the Jacob Diner medal, and one of the Merck awards, John P. Lombardi; New York State Pharmaceutical Association membership, Arthur Leavitt; the Ganbarg medal, Henry Gingold; the second Merck award, Sister Mary Donatus Krist.

George Washington University.—Prof. Charles W. Bliven has been named assistant dean to serve in the place of Dean Briggs during his year's leave of absence on active duty with the Navy.

University of Idaho.—The new pharmacy building is being occupied by students registered in the summer session. Sixty students are in attendance. The dedication of the new building was one of the attractions at the thirty-sixth annual convention of the Idaho State Pharmaceutical

Association.—Prof. Ewart A. Swinyard was recently elected to membership in the Minnesota chapter of Sigma Xi.

University of Illinois.—The second annual conference on modern pharmacy was held on April 15, 16, 17. The general theme of the program had to do with the problems of pharmacy made urgent because of a state of war. The attendance was the same as a year ago and the interest manifested was even greater. The Conference was followed by an open house for high school students. About five hundred attended the exhibit.—New members of Rho Chi are: Robert M. Besancon, Gerston Bruch, William R. Collins, Arthur B. Gauss, Vernon R. Gee, Edward C. Hawkins, Gershon L. Heller, Oscar W. Neiditch, Joseph C. Ocenasek, Joseph J. Petroski, Howard F. Schloemer, Roy O. Sebek, Roderick W. Spence and William J. Weingartner.—At the June commencement Lester Jacobs and Norman Levit were graduated with "High Honors," and Howard Schloemer, Peter Segal and Mary Wieczorek, with "Honors".—On June 12 the faculty gave Dean and Mrs. Serles a complimentary dinner celebrating their twenty-fifth wedding anniversary. They were presented with a silver console set.—A full program has not been undertaken this summer. Courses in general and quantitative chemistry, physics, zoology, and English are being offered. The present plan calls for a change over to the quarter system in September.

State University of Iowa.—The program has been arranged so that students may be in attendance 48 weeks per year. A full 16 weeks summer term is being offered. Seventy-six per cent of the upper classmen have taken advantage of the accelerated course.—Students receiving honor awards are: the Scherling prize, Hugh C. Keasling; the Chekak and Teeters prizes, Wayland C. Fuller; the Cooper prize, Durward V. Karlson; the Kuever prize, Frederick W. Landon; the Rho Chi prize, Darwin D. Moore; the Merck awards, Norman R. Johnson and Elizabeth N. Holmes; the Lehn and Fink medal, Charles F. Watson.—The college has been granted affiliation with the Iowa Chapter of Sigma Xi and will hereafter be represented on the nominating committee.—A course in first aid which was offered as an elective for the first time last year was taken by the entire senior class.

Long Island University, Brooklyn College of Pharmacy.—The library is in the process of being indexed.—Dr. William H. Weyandt, who has been on leave for several months due to serious illness, is improved and will return to his work in September.—The alumni association has had real success in its campaign to forward packages of necessary items to the men in Service. The college forwards regularly to the graduates in Service copies of the college paper.—Dr. A. Lichterman, an active alumnus and formerly head of the Food and Drug Bureau of the Health Department of the City of New York, died June 26.—The prize winners of the graduating class were: Messrs. Bergold, Chanin, H. Epstein, Renda, Saffran, and Salkin.

University of Maryland.—Dr. Theodore T. Dittrich, Ph.D., 1942, has accepted a position in the department of chemistry in the New Orleans College of Pharmacy, Loyola University.—Dr. Kenneth Hamlin, Jr., who last year held a post doctorate research fellowship in the University of

Illinois, has accepted a position as an instructor in organic chemistry at the University of Maryland at College Park.—Dr. George P. Hager, who last year held a research fellowship at Northwestern University, has joined the research staff of Eli Lilly & Company.—Dr. Bernard P. McNamara is in the medical research department at the Edgewood Arsenal. He is being assisted by Alice Harrison, B.Sc., 1942.—Dr. Richard G. Phelps of the 1911 class, has been made head of the chemical section of the Office of Price Administration.—Franklin A. Bolth, M.S., 1942, has accepted a position as chemist with the Minerec Corporation of Baltimore. —Bernard Zenitz, now completing work for the Ph.D. degree, has accepted a post doctorate research fellowship at Northwestern.—Charles Jarowski has accepted a post graduate research fellowship at the University of Illinois, effective in September.—John M. Cross, who is now completing work for the Ph.D., has accepted a position in research and development with Merck & Company.—Milton Reich, Eugene C. Weinbach and Wilson M. Whaley, Jr., have enrolled in the graduate school.—Lieut. Benjamin F. Allen and Frank A. Bellman, former assistants in pharmacy, are now with the 142nd University of Maryland General Hospital Unit in foreign service.—Prizes were awarded for scholarship as follows: Gold medals for general excellence, Warren E. Weaver and Wilson M. Whaley, Jr.; the William Simon memorial prize, Wilson M. Whaley, Jr.; the L. S. Williams prize, Warren E. Weaver; the Conrad L. Wich prize, Milton Reisch.—Certificates of honor: Milton Reisch, Sidney G. Clyman and Alice E. Harrison; members elected to Rho Chi, Sidney G. Clyman, Sidney Sacks, Benjamin Scheinin, Joseph Shear, Morton Smith, George A. Moulton, Jr., and LeRoy C. Keagle.

University of Minnesota.—Dr. E. B. Fischer attended a meeting of the Committee on Pharmacognosy and Pharmaceutical Botany of the Division of Biology and Agriculture of the National Research Council in Washington, D. C. This meeting was called at the request of Dr. Robert P. Fischelis, Chief of the Medical and Health Supplies Section of the War Production Board.—Dean Charles H. Rogers visited Cincinnati, Ohio, recently in the interests of the American Association of Colleges of Pharmacy.—Coy Walker has been appointed instructor at Washington State College.—Thirty-two students were graduated in the 1942 class.—Dean Charles H. Rogers, Dr. Ole Gisvold and Dr. Charles V. Netz participated in the program of the 58th annual convention of the Minnesota State Pharmaceutical Association held in Duluth in June.—The school accelerated its curriculum beginning June 17. Freshmen students will enter in June of each year and complete work for the B.Sc. degree in June three years later.—Awards for scholarship have been made as follows: Minnesota State Pharmaceutical Association scholarship, Raymond Hopponen; the Wulling Club key, Sister Mary McShane; the Lehn and Fink medal, Reid Micklesen; the Rho Chi sophomore prize, Robert Doerge. Elected to honor societies: Rho Chi: James R. Baumgartner, Joe Shink, Melvin Shink, Raymond Hopponen, Richard J. Schibonski, Norval Sisson, Celester Loch, Ardelles Frethem. Sigma Xi: Heber W. Youngken, Jr. Iota Sigma Pi: Catherine Sneed. Fellowships: Melendy graduate fellowships: William Benica, Rutgers and Gertrude Horn, Washington State. Lederle graduate fellowship: James H. Boothe, Washington State. Graduate teaching fellowships: Reid

Micklesen, Edwin H. Carlson, Laverne Small, Edwin F. Olson, Arnold Neva, Azor J. Kleven, Minnesota, and Frank DeGangi, Western Reserve.

University of Nebraska.—Dr. Donald M. Pace, Ph.D., Duke University, for the past five years instructor in physiology, Johns Hopkins University, has been appointed assistant professor of physiology to succeed Prof. C. L. Wible, resigned.—Dr. Michael Ginsburg, associate professor of the classics, has been appointed lecturer in pharmaceutical history. Dr. Ginsburg has just received a second Guggenheim memorial fellowship grant to continue his research on the "Social Policies of the Roman Emperors."—Col. James P. Murphy has been appointed professor of military science and tactics, to succeed Col. Charles A. Thuis, retired. Col. Murphy is a graduate of the Division of Pharmacy of the South Dakota State College, where he has been stationed a number of years in charge of military science.—Sigma Xi initiates: James R. Weeks and Lewis Harris, active; Paul Rasanen, associate.—Students graduating with honors were Eva Speier, "High Distinction," and Phyllis Platz and Marian Roberts, "Distinction." The Lehn and Fink medal went to Eva Speier; the Rasdal award to Phyllis Platz; the Merck awards to Marian Roberts and Raymond Wooster.—Phyllis Platz, Marian Roberts and Eva Speier have been elected to Iota Sigma Pi.—Rufus A. Lyman, Jr., received the Ph.D. major in Zoology from Johns Hopkins University, in June. He has enrolled in the College of Medicine, University of Nebraska, where his younger brother Edwin is a sophomore.—Howard P. Jensen and James Fisher have been appointed graduate assistants in pharmaceutical chemistry and pharmacology for the coming year.—Paul Rasanen will study at Purdue under an industrial grant.—Mr. Earl Rasdal, 1924, of Ogallala, one of Nebraska's most successful druggists, has filed for Congress.—Mr. Stanley Long, retail druggist in Nebraska for many years and now serving his third six-year term as Regent of the University, has filed by petition as candidate for the governorship of the state.

University of North Carolina.—Recent initiates of Rho Chi are Harry Hampton Allen, Jr., Samuel Clark Beavans and Rufus McPhail Herring.

Ohio State University.—The college of pharmacy and the Ohio State student branch of the A.Ph.A. were active in the program of the Ohio State Pharmaceutical Association which held its annual convention in Columbus. Several members of the faculty took part in the program and the students held open house with displays and demonstrations including a miniature medicinal garden. They also decorated a booth in the headquarters hotel where they displayed some of the newer equipment the pharmacist uses. Dean Christensen was the chief speaker at the annual dinner. His subject was "Pharmacy in the Armed Forces."—Mrs. Chana Peer and Miss Eleanor Willerton were the recipients of the Merck awards. Mrs. Peer also graduated with cum laude honors and received the Rho Pi Phi scholarship cup.—New members of Rho Chi are Woodrow Byrum, Emily Smith, Marvin Goldberg, Albert Pickering and George Curts.

University of Oklahoma.—For outstanding scholarship, Irene Klapp was awarded the prize given by the Ladies Auxiliary of the Oklahoma Pharmaceutical Association; the Merck awards went to Arthur Glass and

Maurice Willis.—Robert E. Hood has been elected to Toga, the interprofessional men's honor society.—Oscar Burman, a student at Oklahoma, was accidentally killed in a highway accident near Vinita on the night of June 4. He had become interested in establishing an experimental garden to test the feasibility of growing exotic plants that are needed in the drug, spice and perfume industries. The ground for the garden was being donated by Dean E. N. Comfort of the Oklahoma School of Religion and the young man was being advised in the work by Dr. Ralph Bienfang. It is hoped other young men will become interested in this worthwhile project which Mr. Burman had well under way.

Oregon State College, School of Pharmacy.—Prof. Ernst T. Stuhr supervised a scientific exhibit depicting the U.S.P XII at the June meeting of the Pacific Northwest Medical Association at Portland in June.—The department of pharmacology and pharmacognosy is conducting a survey to determine the extent of experimental and commercial plantings of drug plants in the state.—Prof. John Ellegood, director of the Oregon Board of Pharmacy Drug Laboratory is spending the summer months at the University of Washington.—Prof. Ernst T. Stuhr was called to Washington in June by the War Production Board for a conference relative to strategic and vital medical supplies.

Philadelphia College of Pharmacy and Science.—Dr. Hubley R. Owen, director of Public Health and chairman of the Council of Defense of the City of Philadelphia, gave the address at the 120th annual commencement. His subject was "Keeping Fit for Victory."—Honorary degrees were granted to Dr. Randel C. Rosenberger, professor of preventive medicine and bacteriology at Jefferson Medical College and to Harry Z. Krupp, president of the Philadelphia Wholesale Drug Company.—Prizes for scholarship were awarded as follows: the Proctor prize, the Remmington prize, the Frederick William Haussmann memorial prize, and the William Webb memorial prize to Eric Wentworth Martin; the Frank Gibbs Ryan prize, William Martin Friedman; the Alumni Association prizes, Eric Wentworth Martin and James Caviston Hetrick; the Richard H. Lackey memorial prize, Albert Zonies; the Mahlon N. Kline theoretical pharmacy prize, Herbert Louis Flack, Jr.; the Maisch botany prize, Gilbert Rogers Ullrich; the Women's Auxiliary of the Dauphin Cumberland and Lebanon Counties Pharmaceutical Association prize, Anita Ruth Walker; the Alpha Sigma prizes, James Caviston Hetrick and Wyndham Davies Miles; the Merck awards, Eric Wentworth Martin and Herbert Louis Flack; the Women's Club of the Philadelphia College of Pharmacy and Science prizes, Alfred Nicholas Martin, Jr., and Lawrence Christian Dormuth; the Elizabeth G. Krusen prize, Grace Helen Benjamin.

Purdue University.—Dr. H. George DeKay has been re-elected chairman of the Hospital Pharmacists Section of the Tri-State Hospital Assembly.—Dr. Curtis H. Waldon, University of Montana, has received an appointment to the chemistry staff.—Prof. Thomas Spain was on leave to Ohio State for the spring term.—Dean Glenn L. Jenkins was recently elected vice chairman of the Purdue Branch of the American Chemical Society.—Dr. R. B. Harvey, 1912, now professor of plant physiology, agricultural botany and horticulture at the University of Minnesota,

has recently been elected president of the Minnesota Academy of Science.—Awards for scholarships have been made as follows: Gold Pepper Panhellenic scholarships, Gloria Neumeyer and Mrs. Jane Stamm; the Merck awards, Louis R. Sainte and Sister Kathleen Riley.—The following members of the graduating class have entered the service: Theodore Chekouras, F. W. Dailey, P. F. DeLau, J. D. Heinen, R. H. Hensel, A. C. Kincade, A. A. Rybicki, and P. M. Scott.

Rutgers University, College of Pharmacy.—Dr. R. A. Deno has been inducted into the Sanitary Corps of the Army with rank of 1st lieutenant.

South Dakota State College.—Forty-seven students are registered in the first term of the accelerated program. The second term will begin July 15. The second annual pharmaceutical institute was held on March 2-4. It was well attended and the druggists voted unanimously to have it continued next year.—Willis Brewer has been awarded a fellowship for next year at Ohio State and Boyd Granberg one at the University of Illinois.—Twenty students were graduated at the fifty-sixth annual commencement, Mrs. Hazel S. Quinlan with "Highest Honors" and Willis Brewer, Elmer Levine, and C. A. Locke with "High Honors." Prizes were awarded as follows: for the highest scholastic average, Willis Brewer; Lehn and Fink medal, Mrs. Hazel S. Quinlan; the Merck awards, Raymond Yelinek and Willis Hodson; the South Dakota board of pharmacy prize, Albert Bot.—Doris Berg and Leonard Cook are new members of Rho Chi.

University of Southern California, College of Pharmacy.—Winners of scholastic honors: Lehn and Fink medal, Don James Haley; the Merck awards, Otto B. Lensing II, and Anna Jean Scholl; the Miller Plaque, Robert Spencer Pruett; the Thurston award, Morris Tenenbaum.—The third annual Alumni Conference was held on May 14. The morning and afternoon programs consisted of papers of professional and scientific interest. The annual dinner was held in the evening and the chief speaker was Mr. Milton P. Duffy, his subject being Food and Drug Control in the War Program.

Temple University.—S. Walter Foulkrod, Jr., counsel for the Pennsylvania Pharmaceutical Association and for the Philadelphia Retail Druggist Association, has been appointed lecturer in pharmaceutical law.—The accelerated program for all classes except the freshmen began on June 15. Freshmen will enter in October. For the duration, the professional schools will operate on the three semester basis.—Marie Steigerwalt received six of the eighteen awards given for scholarship. They were the John R. Minehart medal, the Alumni certificate, the Arthur E. James medal, the John Howard Graham prize, the Mary J. Di Silvrestro prize and the Henry Fisher medal.

University of Tennessee.—Acceleration will not occur this summer. The present plan calls for operation on a four quarter basis per calendar year beginning in September.—Albert Musick will be on leave the coming year and will do graduate work at the University of Washington.—At commencement, certificates of honor for scholarship were awarded to

James O. Adams, Charles Bruer, and R. Davis. The Faculty and the Van Vleet prizes went to James O. Adams; the Lehn and Fink medal, R. Davis; the Jacobi prize, Lester Cramblett; the Women's Auxiliary of the Memphis Drug Club prize, Hederick Tuttle.

State College of Washington.—On April 15, a dinner was given in honor of Dean P. H. Dirstine's twenty-five years of service. Many deans and colleagues were present and Registrar Frank T. Barnard gave a brief review of Dean Dirstine's activities and accomplishments in the institution. Congratulatory letters from leaders in pharmacy from all parts of the nation were read.—Hugh C. Vincent has been granted leave for the coming year to continue graduate work. His place will be taken by Coy W. Walker, B.S., University of Buffalo, and now completing work for the Ph.D., at the University of Minnesota.—The master's degree was awarded to three persons at the June commencement.—Lorrayne Le Mar and Leo Sciuchetti were elected associates in Sigma Xi.—New members of Rho Chi are William Beach, Henry Bosshard, Mason Hill, Maryhelen Laney, Clifford Nickle, David Slagle, and Raymond Story.—New Lamda Kappa Sigma initiates are Marjorie Cowan, Shirley Fincher, Ruth Hoadley, Katherine MacKenzie, Margaret Miller, and Viora Yeager.—Robert Honodel and Mason Hill have been elected to Phi Kappa Phi and Leo Sciuchetti to Phi Sigma. The McKesson scholarship was awarded to David L. Slagle and the Lehn and Fink medal to Josephine Demers.—Leo Sciuchetti has been appointed an instructor in pharmaceutical chemistry at Creighton University.—Dean Dirstine was a special lecturer at a review course given for druggists at Vancouver, British Columbia, in June.

University of Washington.—On May 15, the annual pharmacy dinner was held and honors were awarded. This year the program was sponsored by Rho Chi and was built around the unveiling of a portrait of Dean Emeritus Charles W. Johnson because of his long and distinguished service to pharmacy in his state and in the nation.—Awards for scholarship were as follows: McKesson-Robbins fellowship, Jack McNamara; Women's Auxiliary of Washington State Pharmaceutical Association prizes, Katherine Fahey, Edna Scherting, James Ellinger and Winifred Kline; Lehn and Fink medal, Richard P. Jones; Linton memorial award, Marcus Philip Manson; Rho Chi pharmacy honorary prize, Paul Nesbitt; Merck awards, H. L. Verhulst and Leslie Paul.—Rho Chi initiates are William Stickney, Mary Jane Stewart, Mabel Woo, Thomas E. Tennant, Toshio Noma and Lola M. Winn.—Sigma Xi initiates are Kazuo K. Kimura, Louis Arrigoni, Jerome C. Kopet and Otto Loewi.—Dr. Heber Youngken, Jr., will replace Dr. George R. Jones as instructor in pharmacy. Dr. Jones will take up the study of medicine in the Medical College of Virginia.

Wayne University.—Thirty-two persons were graduated on June 11.—2nd Lieutenant Alexander Konchis, a 1940 graduate, died in a head-on collision during glider practice at Randolph Field on April 10. He enlisted in the Army Air Corps in the fall of 1941, and was made a 2nd Lieutenant with the highest scholarship rating in his graduating class.

Western Reserve University, School of Pharmacy.—Donald L. Cook, who is a candidate for the Ph.D degree at the University of Wisconsin in October, has been appointed an instructor in physiology and pharmacology, effective in June. He is replacing Mrs. Nellie Wattts, resigned. —John S. Rosengren, B.Sc., University of Connecticut College of Pharmacy and John W. Schermerhorn, B.Sc., Rutgers University, College of Pharmacy, have been appointed graduate assistants effective October 5. —Mr. Frank Di Gangi has accepted an assistantship at the University of Minnesota.—The following received the masters degree at the June commencement: Frank V. Potrepka of Creighton University; Leo F. Godley, pharmacist in Columbia Hospital of Richmond County, Columbia, South Carolina; Sister Mary Eheldrede, 1941 recipient of Fairchild Scholarship, pharmacist in St. Mary's Hospital, Brooklyn; John W. Argabrite, South Dakota State College intends to continue specialization in pharmacology.—A dinner in honor of the fourteen graduates was given at the annual alumni party on June 10.—Scholarship honors have been awarded as follows: sophomore, junior and senior tuition awards, Irving Barron, Bernard Guthrie and Julius Appel, respectively; the Merck awards, Theresa R. Gerlock and Richard Mailman; elected to Rho Chi, Julius Appel, Theresa Gerlock, Richard Mailman and Albert Schultz.

MARRIAGES

Dr. Heber W. Youngken, Jr., instructor in pharmacy, University of Washington and Miss Daphne Freda Goodwin of Mazeppa, Minnesota, on March 28, 1942, at Minneapolis, Minn.

Lucien H. LeMaitre, assistant in the department of chemistry and Miss Phyllis A. Toon, assistant in the administrative office, Massachusetts College of Pharmacy, on June 20, 1942.

NEW IN THE FAMILY

Lois Mae Kendall.—Born April 12, 1942. Daughter of Prof. and Mrs. H. L. Kendall, Purdue University.

Harvey Edward Goldner.—Born January 16, 1942. Son of Dr. and Mrs. Karl Goldner, University of Tennessee.

Douglas Edgar Kelly.—Born January 16, 1942. Son of Dr. and Mrs. E. A. Kelly, University of Washington.

A. Roland Wilkoc.—Born April 18, 1942. Son of Prof. and Mrs. August Wilkoc, Brooklyn College of Pharmacy.

Harriet Elaine Hazleton.—Born April 30, 1942. Daughter of Dr. and Mrs. L. W. Hazleton. The George Washington University.

Rodolfo S. Escabi, Jr.—Born June 5, 1942. Son of Mr. and Mrs. Rodolfo S. Escabi, College of Pharmacy, University of Puerto Rico.

Miscellaneous Items of Interest
Memorials

WASHINGTON HAYNE ZEIGLER

On Thursday, May 7, 1942, in the early hours of the morning, Dr. Washington Hayne Zeigler, for many years Director of the School of Pharmacy of the Medical College of the State of South Carolina, died at a local infirmary after an illness of about three hours. Active to the last, he was in his office as usual on the day preceding his death, worked in his garden in the late afternoon, and attended a faculty meeting in the evening.

Dr. Zeigler was born at Orangeburg, S. C., February 9, 1876. He was educated in Orangeburg and Charleston, receiving his degree of Ph. G. at the Medical College in 1896, and the honorary degree of Pharm. D. in 1914. He joined the faculty of the Medical College in 1903 as lecturer in botany and pharmacognosy, and in 1913 became professor of pharmacology and materia medica. In 1915 he was made director of the school of pharmacy as well, in which capacity he acted up to the time of his death.

Dr. Zeigler was widely known in his chosen field and greatly admired by many friends throughout the country and received international recognition when selected to serve as a representative from the United States on an international committee for the determination of standards, meeting at Berne, Switzerland, several years ago. He was much interested in pharmacological research, and particularly in his earlier days, published a considerable number of articles giving the results of his finding in the various scientific journals, later reprinting them for distribution on request. At the time of his death he was working on notes of experiments having to do with the thymus gland. He served as president of many associations including the American Association of Colleges of Pharmacy, the South Carolina Pharmaceutical Association and the Pharmaceutical Association of the City of Charleston.

His love of flowers and plant life was reflected in his beautiful garden at his home on Mt. Pleasant where he took a particular interest in rare flowers and in two large oaks which he cultivated as living monuments to two grandchildren whose deaths occurred a few years ago.

He is survived by his widow, the former Miss Trent Walton, one daughter, two sons, and several grandchildren.

William A. Prout.

CHARLES E. CASPARI

Charles E. Caspari, dean of the St. Louis College of Pharmacy, St. Louis, Missouri, died on June 9th at his home in University City, Missouri, of a liver ailment that had partially incapacitated him for several months. Private funeral services were held at the home on June 11th.

Dean Caspari was born in Baltimore, Md., April 9, 1875, in the same room in which his father had been born twenty-five years earlier, over a drug store formerly owned by his grandfather, Charles Caspari.

He was descended from a line of pharmacists of note, for many will remember his father, Charles Caspari, Jr., an outstanding pharmaceutical educator and author.

Dean Caspari received his primary education in the public schools of Baltimore. After graduation from high school he attended Johns Hopkins University for seven years. The last six years of this time he held scholarships and assistantships, receiving the A. B., and in 1900, the Ph. D degree from that institution. The year following his graduation he was an assistant to Marston T. Bogert in organic chemistry at Columbia University.

In 1901 he accepted a position as research chemist with Mallinckrodt Chemical Works in St. Louis. A continuing urge to teach caused him to accept the professorship in chemistry in the St. Louis College of Pharmacy in 1903 where he taught until 1930, since which time he had been emeritus professor of chemistry. He was an inspiring teacher of chemistry and a most exacting one as his many students vividly recall. In 1926 he was made dean of the college which position he occupied at the time of his death. As dean, in addition to the activities of that office, he performed many of the duties commonly associated with the president of a college, particularly in the field of finance. The welfare of the college he served was always foremost in his mind and he served it exceptionally well.

In 1903 he married Miss Emilie Ganz to which union two daughters and one son were born: Mrs. Oliver Abel, Jr., Charles E. Caspari, Jr., and Emilie Caspari all of St. Louis.

During a period of thirty years, from 1910 to 1940, he served as a member of the revision committee of the United States Pharmacopoeia. For many years he acted as consulting chemist to several large manufacturing firms. In this work his keen analytical mind proved extremely valuable. His services as a consultant were in such demand that in 1930 he resigned as professor of chemistry in order to be free to devote more of his time to his other work.

He was a member of the American Pharmaceutical Association and rarely failed to attend the annual meetings of this association and of the American Association of Colleges of Pharmacy, in both of which he always took an active part. He was a member of the American Chemical Society and served as chairman of the St. Louis section. He was a Fellow of the American Association for the Advancement of Science and a member of the Franklin Institute of Philadelphia and the Chemists' Club of New York. He was a life member of the Missouri Pharmaceutical Association. He also held membership in Bellerive Country Club, University Club, Missouri Athletic Club, and Noonday Club.

His was indeed a wonderful personality. He was sincere, fair and forthright always. His continual good nature made him approachable at all times, and his ready wit and timely humor made, and kept for him, a host of friends. In his passing, pharmacy has lost a keen mind and a wonderful personality, the St. Louis College of Pharmacy an invaluable and loyal supporter, and many of us as true a friend as we shall ever know.

Arthur F. Schlichting.

Program of the American Association of Colleges of Pharmacy

Forty-Third Annual Meeting

Denver, Colorado, August 16-18, 1942

President, R. A. Kuever; Vice-President, P. A. Foote; Secretary-Treasurer, Zada M. Cooper; Chairman, Charles H. Rogers.

SUNDAY, AUGUST 16

8:00 P. M. Meeting of the Executive Committee.

MONDAY, AUGUST 17

9:00 A. M. Meeting of the Executive Committee.
9:30 A. M. Conferences of Teachers.
1:30 P. M. First Session.
6:00 P. M. Annual Dinner.
8:00 P. M. Second Session.

TUESDAY, AUGUST 18

9:30 A. M. Joint Session of the American Pharmaceutical Association, National Association of Boards of Pharmacy.
8:00 P. M. Third Session.

Conference of Teachers of Pharmacy

Chairman, Earl P. Guth; Vice-Chairman, Louis W. Busse; Secretary, John F. McCloskey.

MONDAY, AUGUST 17, 9:30 A. M.

Direction Pharmacy Is Taking.

1. East of the Mississippi River, Robert P. Fischelis.
2. West of the Mississippi River, David W. O'Day.

A Symposium on the Condition of Pharmacy.

3. In Metropolitan Areas, Marvin J. Andrews.
4. In Sales Promotion Work, Ralph W. Clark.
5. In Pharmaceutical Associations, Charles Hall Evans.
6. In Clinics and Hospitals, Edward J. Ireland.
7. In Suburban Areas and Neighborhood Stores, E. N. Beesley.
8. In Colleges of Pharmacy, ...
9. In the Manufacturing Industries, Russell A. Cain.

Conference of Teachers of Chemistry

Chairman, George P. Hargreaves; Vice-Chairman, Lloyd M. Parks; Secretary, Arthur E. James.

MONDAY, AUGUST 17, 9:30 A. M.

A Symposium on Semimicro Qualitative Analysis.

1. A Comparison of Macro- and Semimicro- Methods of Qualitative Analysis, H. B. Van Valkenburgh.
2. The Relative Educational and Economic Efficiencies of Macro- and Semimicro-Qualitative Analysis, Ray S. Kelley.
3. Experiences in Teaching Qualitative Analysis by the Semimicro Method, Louis A. Reber.
4. A General Discussion of the Papers Presented and Other Aspects of the Topic.

Conference of Teachers of Pharmacognosy and Pharmacology

Chairman, A. John Schwarz; Vice-Chairman, Robert L. McMurray; Secretary, Lloyd W. Hazleton.

MONDAY, AUGUST 17, 9:30 A. M.

1. The Needs and Opportunities for Expertly Trained Pharmacognosists, Elmer H. Wirth, Heber W. Youngken and Edward J. Ireland.
2. A Suggestion for the Inclusion of Cyto-genetics into the Course of Pharmacognosy, William J. Bonisteel.
3. Teaching the Peripheral Motor Nervous System Drugs According to the Modern Classification, Raymond P. Ahlquist.
4. Some Pharmacological Problems of the National Formulary, Melvin W. Green.
5. A Laboratory Experiment in the Measurement of Reaction Time, James M. Dille.
6. A Suitable Class Demonstration of Sex-Difference to Sodium Evipal in the White Rat, Harald G. O. Holck.
7. Why Bioassay?, James C. Munch.
8. Periodicals Relating to Pharmacology: A Preliminary List, George M. Hocking.
9. A Practical and Inexpensive Setup for Student Demonstrations in Pharmacology, Raymond P. Ahlquist.

Conference of Teachers of Pharmaceutical Economics

Chairman, Lawrence F. Ferring; Joseph H. Goodness.

1. The Use of Current Statistics as Teaching Materials in Pharmaceutical Economics, Paul C. Olsen.
2. Comparisons Are Not Odious, Clarence M. Brown.
3. The Human Element in Drug Store Salesmanship, P. W. Combs.
4. A Census of Teachers of Pharmaceutical Economics, Joseph H. Goodness.

Sessions of the Association

FIRST SESSION, MONDAY, AUGUST 17, 1:30 P. M.

1. Roll Call.
2. Appointment of Committee on Resolutions.

3. Appointment of Nominating Committee.
4. Appointment of Auditing Committee.
5. Address of the President, R. A. Kuever.
6. Report of the Secretary-Treasurer, Zada M. Cooper.
7. Reports of Standing Committees:
   (1) Committee on Educational and Membership Standards, L. David Hiner.
   (2) Committee on Teaching Methods, George L. Webster.
   (3) Committee on Activities for Alumni, Charles W. Bauer.
   (4) Delegates to the American Council on Education, Rufus A. Lyman.

MONDAY, AUGUST 17, 6:00 P. M.

Joint Annual Dinner with the N. A. B. P.
Address, President Robert L. Stearns, University of Colorado.

SECOND SESSION, MONDAY, AUGUST 17, 8:00 P. M.

1. Reports of Standing Committees, Continued.
   (1) Committee on Relation of Boards and Colleges, Howard C. Newton.
   (2) Committee on Libraries, Charles O. Lee.
   (3) Committee on Problems and Plans, Rufus A. Lyman.
2. Report of the Committee on Distributive Education, Earl R. Serles.
3. Report of the Editor of the American Journal of Pharmaceutical Education, Rufus A. Lyman.
4. Report on American Foundation for Pharmaceutical Education, Ernest Little.
5. Presentation of Recommendations from the Conference of Teachers.

THIRD SESSION, TUESDAY, AUGUST 18, 2:00 P. M.

1. Reports of Special Committees:
   (1) Committee on Predictive and Achievement Tests, A. B. Lemon.
   (2) Committee on Informative Literature, B. V. Christensen.
   (3) Committee on Scholarship, H. Evert Kendig.
   (4) Committee to Revise Constitution and By-Laws, A. G. DuMez.
   (5) Representative to National Wholesale Druggists Association, Robert C. Wilson.
2. Report of Historian, George Urdang.
3. Report of the Committee on Resolutions.
4. Report of the Auditing Committee.
5. Miscellaneous Business.
6. Election of Officers.
7. New Business.
8. Executive Session.

Joint Session of the American Pharmaceutical Association, the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy

TUESDAY, AUGUST 18, 1942, 9:30 A. M.

1. Report of the Fairchild Scholarship Committee, Justin L. Powers.
2. Report of the Pharmaceutical Syllabus Committee, Henry M. Burlage.
3. Report of the Committee on Status of Pharmacists in the Government Service, H. Evert Kendig.
4. Report of the American Council on Pharmaceutical Education, A. G. DuMez.
5. Report of the Committee on Legislative Policy, Robert L. Swain.
6. Report of Committee on Personnel Problems, Joseph B. Burt.
7. Report of Committee on Professional Relations:
   (a) College Activities, George C. Schicks.
   (b) State Activities, Charles H. Evans.
8. Report of Committee on Dental Pharmacy, George C. Schicks.

Program of the American Institute of the History of Pharmacy
Second Annual Meeting

To be held at Denver during the week of August 16, exact time and place to be announced.

1. Report on the business of the A.I.H.P., Mr. J. Murphy.
2. Report on the work of the A.I.H.P., Dr. George Urdang.
3. The aspects resulting from the affiliation of the A.I.H.P. with the A.Ph.A., Dr. B. V. Christensen.
4. The A. I. H. P. and the pharmaceutical press, Dr. Rufus A. Lyman and Dr. R. L. Swain.
5. Miscellaneous.

Second Annual Seminar of the American Institute of the History of Pharmacy

President A. H. Uhl has called the annual meeting of the Council of the Institute for 1942 at Purdue University on July 27 and 28 in connection with the second seminar.

The principal matters for discussion will be:

1. The work done and to be done by the Institute.
2. The financial support of the Institute.

It will be of interest to know that the Director of the American Institute of the History of Pharmacy has been asked for his application

for a Resident Fellowship of the Library of Congress in order "to survey and evaluate the collections in the library in his particular field, and to recommend the acquisition of individual items in his field, and to recommend an acquisition policy for the Library of Congress . . . , to make recommendations calculated to improve the accessibility and the service and to extend the knowledge of the material in his particular field in the Library of Congress."

This appointment may become effective for the academic year 1943-44. It would mean, that the American profession of pharmacy is given an opportunity of establishing in the official and most prominent general library in this country, a department really representative of pharmacy and an acquisition policy keeping up this standard. The pre-supposition policy is that the existence and the work of the American Institute of the History of Pharmacy can be maintained.

The program for this meeting was printed in the April issue.

Program of the 90th Annual Meeting of the American Pharmaceutical Association Denver, August 16-21, 1942*

SUNDAY, AUGUST 16

9:30 A. M.	American Council on Pharmaceutical Education.
1:00 P. M.	Meeting of Officers and Regional Directors, American College of Apothecaries.
2:00 P. M.	Council, A.Ph.A.
8:00 P. M.	Meeting of Executive Committee, A.A.C.P.
8:00 P. M.	Opening Entertainment.

MONDAY, AUGUST 17

9:30 A. M.	First Session, American Association of Colleges of Pharmacy.
9:30 A. M.	First Session, National Association of Boards of Pharmacy.
9:30 A. M.	First Session, American College of Apothecaries.
11:30 A. M.	Conference of Pharmacy Law Enforcement Officials.
12:30 P. M.	Luncheon, N.A.B.P.
1:30 P. M.	Second Session, N.A.B.P.
1:30 P. M.	Second Session, A.A.C.P.
1:30 P. M.	Second Session, American College of Apothecaries.
6:00 P. M.	Joint Dinner—N.A.B.P. and A.A.C.P.
8:00 P. M.	Combined Session—N.A.B.P., A.A.C.P. and A.Ph.A.

TUESDAY, AUGUST 18

9:00 A. M.	Final Session, N.A.B.P.
9:00 A. M.	Final Session, A.A.C.P.
9:00 A. M.	Final Session, American College of Apothecaries.
9:00 A. M.	National Conference on Pharmaceutical Research.
12:15 P. M.	Luncheon, Committee on Recipe Book.

2:00 P. M. First Session, House of Delegates.
2:00 P. M. First Session, Scientific Section.
2:00 P. M. First Session, Sub-Section on Hospital Pharmacy.
2:00 P. M. American Institute of the History of Pharmacy.
6:00 P. M. Dinner, Rho Chi Society, followed by Annual Meeting.
8:30 P. M. First General Session, A.Ph.A.

WEDNESDAY, AUGUST 19

8:00 A. M. Breakfast, Members U.S.P. Committee of Revision and Board of Trustees.
9:30 A. M. Council, A.Ph.A.
9:30 A. M. Second Session, Scientific Section.
9:30 A. M. First Session, Section on Education and Legislation.
9:30 A. M. First Session, Section on Practical Pharmacy.
9:30 A. M. First Session, Section on Historical Pharmacy.
9:30 A. M. First Session, Section on Pharmaceutical Economics.
9:30 A. M. First Session, Conference of Pharmaceutical Association Secretaries.
10:30 A. M. Committee on Nominations.
10:30 A. M. Committee on Resolutions.
12:30 P. M. Luncheon, Kappa Psi Fraternity and Lambda Kappa Sigma Sorority.
12:30 P. M. Luncheon, Phi Delta Chi Fraternity.
2:30 P. M. Second Session, House of Delegates.
2:30 P. M. Second Session, Sub-Section on Hospital Pharmacy.
7:30 P. M. Joint Banquet, A.Ph.A. and Affiliated Organizations.

THURSDAY, AUGUST 20

9:30 A. M. Second General Session.
2:30 P. M. Second Session, Section on Practical Pharmacy.
2:30 P. M. Second Session on Historical Pharmacy.
2:30 P. M. Second Session, Section on Education and Legislation.
2:30 P. M. Second Session, Section on Pharmaceutical Economics.
2:30 P. M. Second Session, Conference of Pharmaceutical Association Secretaries.
2:30 P. M. Third Session, Scientific Section.
2:30 P. M. Committee on Resolutions.
6:30 P. M. Dinner, Past Presidents, A.Ph.A.
7:30 P. M. Final Session, House of Delegates.
9:30 P. M. Final General Session.

FRIDAY, AUGUST 21

9:30 A. M. Council, A.Ph.A.

• This represents the "streamlined" program of the American Pharmaceutical Association and the affiliated organizations sent out by the secretary under date of July 10. Since the program of the American Association of Colleges of Pharmacy was already set in type no attempt has been made to adjust it to the American Pharmaceutical Association program. That should be done by each individual in making his plans.—Editor.

Detailed Report of the Committee on Pharmacy Predictive and Achievement Tests

The Committee on Pharmacy Predictive and Achievement tests inaugurated its testing program in the fall of 1939, and has, up to date, applied predictive tests to the entering students (all those who have not had previous college training) in twelve member colleges of the Association in 1939 and eleven member colleges in 1940. One college dropped from the testing program because of change in curriculum. In 1939 approximately 500 students took the examinations, and in 1940 the number was about 430.

The tests being used are:

1. American Council on Education Psychological Examination for College Freshmen. (Current edition)
2. Iowa Mathematics Training Test Series MT-1, Revised, Form A
3. Cooperative English Test, Form PM
4. Cooperative General Science Test, Form P.

The results of the tests are given in Table 1:

TABLE 1

	Psychological Test		Mathematics		English		General Science	
	1939	1940	1939	1940	1939	1940	1939	1940
School A								
High Score	96	99	98	99	99	100	89	96
Low Score	21	7	22	4	6	4	3	0
Median	57	61	67	57	74	61	41	40
Upper Quartile	74	83	89	85	85	85	62	64
Lower Quartile	39	26	45	37	53	44	17	20
Rank	4	3-4	1	2-3	2	1-2	7	8
School B								
High Score	99	99	97	99	99	99	99	99
Low Score	13	31	4	15	3	3	2	5
Median	83	66	58	81	78	61	47	59
Upper Quartile	94	85	78	90	91	80	73	82
Lower Quartile	56	46	38	60	55	35	26	40
Rank	1	2	3	1	1	1-2	5	2
School C								
High Score	98	83	93	94	91	78	99	99
Low Score	11	1	5	2	13	3	19	1
Median	74	56	56	57	51	32	67	51
Upper Quartile	84	80	72	78	71	61	88	85
Lower Quartile	47	30	21	24	30	9	47	15
Rank	2	5	4	2-3	4	8	1	5
School D								
High Score	99	93	98	93	97	99	96	98
Low Score	5	11	2	4	1	15	2	1
Median	47	35	48	44	45	43	45	47
Upper Quartile	69	64	78	68	65	67	63	61
Lower Quartile	30	21	24	29	25	32	28	27
Rank	6	9	7	7	8	6	6	6

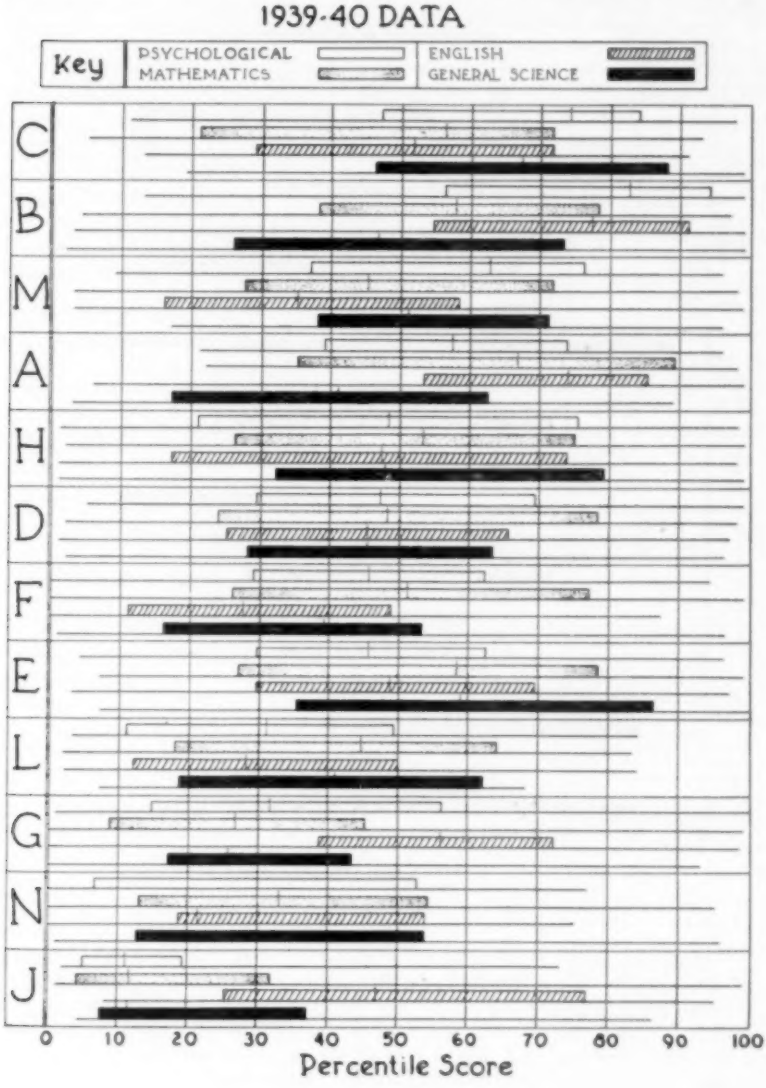
	Psychological Test		Mathematics		English		General Science	
	1939	1940	1939	1940	1939	1940	1939	1940
School E								
High Score	96	99	99	94	97	99	100	99
Low Score	4	9	7	1	3	17	7	9
Median	46	41	58	46	49	57	49	64
Upper Quartile	62	70	79	70	69	78	86	85
Lower Quartile	30	30	27	21	30	35	35	43
Rank	7	7	2	5	5	5	3	1
School F								
High Score	94	95	99	96	87	94	96	91
Low Score	0	1	0	0	0	1	1	0
Median	46	18	51	36	28	29	39	29
Upper Quartile	73	44	77	65	49	56	53	68
Lower Quartile	29	7	26	13	11	13	16	10
Rank	8	11	6	9	10	9-10	10	10
School G								
High Score	100	93	99	91	98	93	93	88
Low Score	1	1	0	1	0	0	0	1
Median	31	31	27	44	56	29	26	20
Upper Quartile	56	46	45	57	72	48	43	55
Lower Quartile	14	11	9	21	39	11	13	9
Rank	9	10	11	6	3	9-10	11	11
School H								
High Score	98	97	99	100	98	98	99	98
Low Score	1	2	2	4	1	3	1	4
Median	48	61	53	56	47	55	48	53
Upper Quartile	75	80	74	77	74	78	79	78
Lower Quartile	21	22	26	23	17	22	32	27
Rank	5	3-4	5	4	6	4	4	4
School L								
High Score	84	94	83	93	84	94	73	97
Low Score	3	6	2	2	2	9	7	6
Median	31	39	45	24	28	40	41	37
Upper Quartile	49	58	64	50	50	56	62	66
Lower Quartile	11	30	18	9	12	22	18	22
Rank	10	8	9	11	11	7	8	9
School M								
High Score	96	99	98	98	99	91	96	94
Low Score	9	24	3	0	3	9	17	1
Median	63	71	45	33	35	59	51	57
Upper Quartile	76	85	71	51	58	78	71	73
Lower Quartile	37	60	28	13	16	22	38	31
Rank	3	1	8	10	9	3	2	3
School N								
High Score	77	96	95	98	85	100	96	91
Low Score	0	0	0	1	0	1	1	1
Median	20	52	33	38	22	13	40	44
Upper Quartile	53	65	55	60	53	59	53	68
Lower Quartile	7	25	13	19	9	4	13	22
Rank	11	6	10	8	12	11	9	7

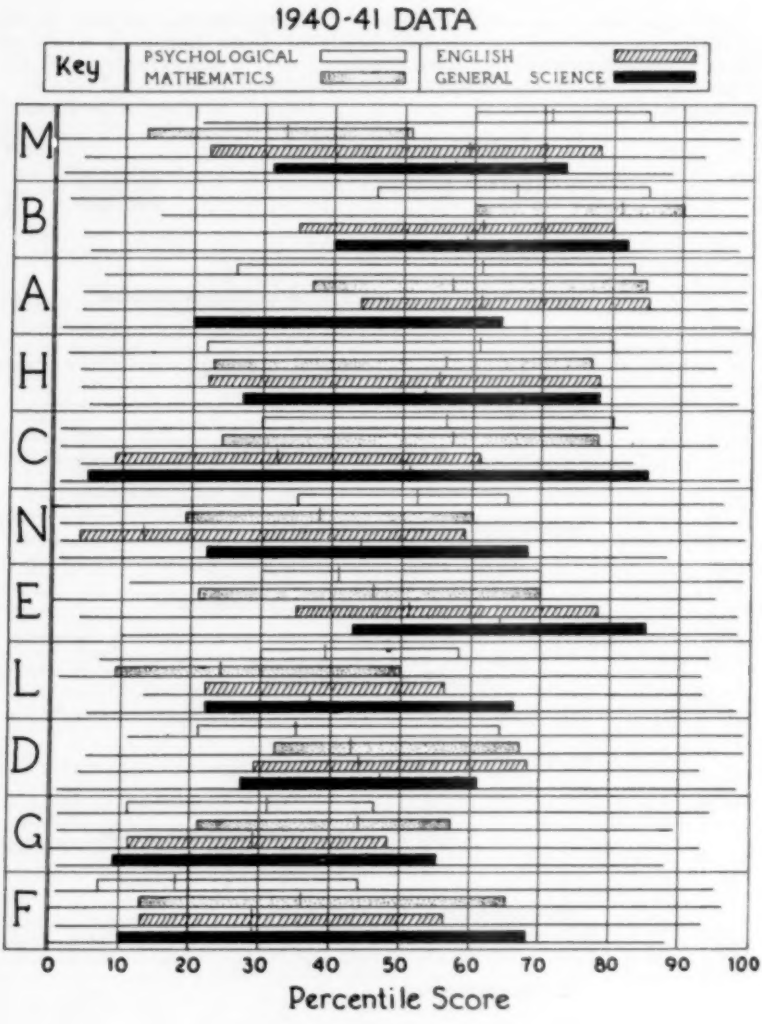
Figures 1 and 2 show the results in graphic form.

There are, of course, no logical conclusions which can be drawn at the present time. The object in offering the above information at the present time is to enable heads of schools to follow the trend of the entering students in their own schools as compared with others.

The fact that the chairmanship of this commmittee is now in the unusually capable and experienced hands of Dean Lemon is a strong source of satisfaction to the past chairman, and is a guarantee that the study will ultimately be brought to a successful conclusion.

January 9, 1942 Carl J. Klemme, Chairman.





University of Puerto Rico, College of Pharmacy.—At a meeting of the senior class together with several registered pharmacists of Puerto Rico, plans were made for the formation of the Alumni Association. Committees were named for the calling of and organization of a general meeting and for writing the constitution and by-laws. Interest was shown and the successful organization of the pharmacy alumni seems to be assured.

American Institute of History of Pharmacy.—On May 4, Dr. George Urdang gave an address before the annual meeting of the American Association of the History of Medicine at Atlantic City. This was done at the request of Dr. Henry E. Sigerist, director of the Institute of the History of Medicine at Johns Hopkins University and secretary of the American Association of the History of Medicine. Dr. Urdang's paper dealt with "The Mystery about the English Pharmacopoeia, 1618." It represented a report on the results of an investigation of the mysterious withdrawal of the first issue of the London Pharmacopoeia published only seven months later. Based on a thorough comparison of the (Latin) texts of both issues, an explanation of the differences found and their meaning was attempted, the special character of both issues determined and the question considered as to the part the individual members of the Royal College of Physicians of London had played in the preparation of each issue. Finally an attempt was made to determine the place of both books within the general scientific and cultural atmosphere of the time concerned. The paper found a very kindly reception. There were about fifty persons present, most of them active in medico-historical research. A number of them expressed their satisfaction about the existence of an institution within the United States of America where history of pharmacy was to be cultivated systematically and reliable pharmaceutico-historical information could be obtained. On the trip east Dr. Urdang also spoke before the students of the School of Pharmacy of the University of Maryland on "The Bicentennial of the Birth of the Apothecary-Chemist, C. W. Scheele." He stressed the fact that it was because Scheele was a pharmacist that made it possible for him to develop into one of the greatest chemists of all time. He showed that real greatness is always due to a combination of character and achievement and impressed upon the students the idea of the possibilities for achievement offered in and by pharmacy. At Washington he planned with Dr. Kelly for a Scheele symposium for the Denver meeting. The program will consist of a lecture by Dr. Urdang, the director, the presentation of a set of pictures pertaining to the life history of the apothecary-chemist and the presentation of a brochure containing these pictures, a short survey of Scheele's life, a table listing his achievements, and a time table of his experiments.

Massachusetts College of Pharmacy.—Prof. George L. Burroughs, associate professor of biology and pharmacognosy was retired on July 1. He served this institution since his graduation in 1899 except during the World War when he served in the military supply division of the Red Cross and later was associated with Mr. Herbert Hoover in rehabilitation work in Europe. After returning to this country he taught pharmacognosy at the University of Mississippi for a time and assisted the Red Cross in rehabilitation work in the flooded areas along the Mississippi River before returning to his alma mater.—The medicinal plant garden has been greatly enlarged through the introduction of many species of plants. Located on two acres of land adjacent to the world-famous Arnold Arboretum, it is readily accessible to the public as well as to the students and faculty of the college. A recent issue of the Bulletin of the Arnold Arboretum was devoted to a

description of the garden and a list of the plants established there.—New initiates of Rho Chi are Walter H. Sharawara, Frances T. Smith, Henriette Smeeters, Albert Arzoomanian, Walter F. Charnicki, Gerald N. D'Amico, Lucy E. Duffy, Winifred A. Guba, Lewis Lappas and Maurice Lurensky.—At the commencement exercises the following awards were made for outstanding scholarship in particular fields of study: Alphonse A. Miskinis, dispensing pharmacy; Stephanie L. Lach and George Di Cicco, analytical chemistry; Charles A. Papacostas, business administration; Jacques Kunitz, organic chemistry; E. Warren Heaps, Jr., materia medica, and Maurice L. Lurensky, pharmacology.—The graduate school although established only two years ago, is attracting an increasingly large number of students from this and other institutions. On May 27, ten candidates were awarded the degree of Master of Science in Pharmacy.—The following scholarships have been awarded for the session of 1942-43: the Edgar L. Patch memorial to Donald J. Morrison, Jr.; the Massachusetts State Pharmaceutical Association scholarship, to Philbrook H. Knight; the Gilman Brothers scholarship to Gilman N. Cyr; the George F. H. Markoe memorial to Gaspar G. Bellitte; the Traveling Men's Auxiliary of the Massachusetts State Pharmaceutical Association scholarship to Remo J. Zola; the Boston Druggists' Association scholarship to Philip F. Woodlock; the Robert W. Greenleaf memorial to John R. Colella, Jr.; the M.C.P. Students scholarship to Albert Arzoomanian; the Rho Pi Phi scholarship to Isadore Levy; to Lewis Lappas, Robert W. Elkas, and Gordon K. Clifford, the Phi Delta Chi senior, junior and sophomore scholarships respectively; the McKesson and Robins scholarship to Norman G. Bourdeau; the Julian W. Baird memorial scholarship to David S. Kazaka; the James O. Jordan memorial to Alfred Klugmann; the Florin J. Amrhein memorial to Kenneth E. Hanson; the Kappa Psi scholarship to Roger W. Mattison; and the Mu Chi Phi sorority scholarship to Harriet M. Leroux.

Purdue University, School of Pharmacy.—Mr. Lee Worrell, Ph.D., 1939, has been appointed to an instructorship at the University of Michigan. Dr. Worrell has been teaching at Drake University.—Jack Werts, assistant in the manufacturing laboratory during the past year, has enlisted in the Naval Aviation Corps.—David Schlicting, University of Michigan, 1942, son of Dean Schlichting of the St. Louis College of Pharmacy, and John Beenigk, Western Reserve, have been appointed assistant pharmacists in the Apothecary.—Edward Szymanski, Rutgers University and Raphael Bachman, Creighton University, have been appointed graduate assistants in pharmaceutical chemistry.—Miss Ina Griffith of the University of Oklahoma has been appointed A. Ph. A. fellow in pharmacy.—Mr. Thomas Spain, instructor in pharmacy at Ohio State, has been appointed graduate assistant in the manufacturing pharmacy laboratory.—Dr. Ernest Belas, Ph.D., 1940, who has been professor of pharmaceutical chemistry at Ohio State, has accepted a position in the Experimental Research Laboratories of Burroughs Wellcome & Company, Tuckahoe, New York.—Plans have been completed for an expansion of the seating capacity of the pharmacy library by thirty-three per cent.—The Apothecary is supplying chemicals, drugs, prescriptions, and sundry items to the U. S. Naval Training School and

to the War Department Civilian Protection School.—Dr. H. George DeKay is in charge of the first aid section of the air warden's class of the cities of Lafayette and West Lafayette. The course consists of 43 hours of instruction, 10 of which are in first aid. The registration number is 250 and there are ten instructors.

New Books

Synopsis of Materia Medica, Toxicology and Pharmacology by Forrest Ramon Davison, B. A., M. Sc., Ph. D., M. B., Medical Department, The Upjohn Co., Kalamazoo, Mich. Formerly Assistant Professor of Pharmacology in the School of Medicine, University of Arkansas, Little Rock. Second Edition. 1942. 695 pages. Illustrated. The C. V. Mosby Company, St. Louis. Price $5.75.

In the new edition the author has made various deletions; however, the advances in pharmacology, especially in the sulfonamide group, vitamins and hormones have been so rapid that the second edition is 62 pages larger than its predecessor. Dr. Davison has included all of the additions to the new Pharmacopoeia, the National Formulary VII and the 4th supplement to the British Pharmacopoeia. It should also be mentioned that the author has improved upon the material in the first edition by rewriting various sections and by having had personal friends especially well versed in the pharmacology of selected groups go over the manuscript before printing. As stated, the plan of the first edition has been followed; this includes a considerable number of suitable prescriptions in both the metric and apothecary system, a feature that will be of help to the pharmacy student in correlating pharmacology with pharmacy. In spite of the increase in volume, the price of the new Davison has been kept moderate.

H. G. O. H.

A Textbook of Bacteriology by Thurman B. Rice, A. M., M. D., Professor of Bacteriology and Public Health at the Indiana School of Medicine. Third edition, revised, 1942. 560 pages. 119 illustrations. W. B. Saunders Company. Price $5.00.

The commentator is not a bacteriologist, but he thinks he can recognize a good biological text from the viewpoint of the student. The criteria he goes by when he reads a text are its clearness, its conciseness, the absence of conflicting and confusing details, and finding himself led on and on as if he were reading a Conan Doyle novel. When this happens one may be sure he has a good teaching text. While bacteriology is one of the newest of the sciences, it is a basic one in the pharmaceutical curriculum. As a new science, it has not matured in its theories or its nomenclature or its possibilities or its applications or its techniques. From the student's point of view it might easily be defined as the science of confusion. Dr. Rice in this new edition has done a fine service in clarifying the study of bacteriology for the student of pharmacy. Teachers of bacteriology in schools of pharmacy should give the text serious consideration.

R. A. L.

The Rat in Laboratory Investigation by a staff of thirty contributors, edited by John Q. Griffith, Jr., M. D., Associate in Medicine, School of Medicine, University of Pennsylvania and Edward J. Farris, Ph. D., Executive Director and Associate in Anatomy, Wistar Institute of Anatomy and Biology. 1942. 488 pages. 178 illustrations. J. B. Lippincott Company. Price $7.50.

This book is indispensable in any laboratory in which the rat or any other small laboratory animal is being used for biological investigation. The methods given apply to any field of study. Some of the contributors to the work are men whose chief interests are in the biological standardization of drugs connected with colleges of pharmacy and the pharmaceutical manufacturing industry. The techniques proposed in this book have been thoroughly tested by experienced investigators and can be relied upon as dependable. The rat as an experimental animal is economical and teachers by the use of the techniques here described should be able to devise experiments on rats for teaching purposes which would be satisfactory and reduce the cost of experimental teaching which is an important item especially at the present time. Special studies, as in the case of the teeth, were made and properly subsidized, which makes the material much more valuable. The illustrations are unusually clarifying and the mechanics of the book measures up to the high standards of the publisher. The need for such a reference work was so great and the task of furnishing it so well accomplished that the book should be well supported and placed in all our libraries and laboratories. One might well say that the study of the book furnishes a liberal education in itself. The Wistar Institute is to be congratulated for sponsoring this publication.

R. A. L.

The American Pocket Medical Dictionary edited by W. A. Newman Dorland, A. M., M. D., member of the Committee on Nomenclature and Classification of Diseases of the American Medical Association and Editor of the "American Illustrated Medical Dictionary." 17th edition. 1942. Thoroughly revised. 1037 pages. W. B. Saunders Company. Price $2.00, plain; $2.50, thumb index.

A standard dictionary in its 17th edition is a sufficient testimonial of its worth. In revising, 70 per cent of the pages have been changed, and 2,000 new words added. Definitions have been modified in keeping with modern usage and understanding. All important pharmaceutical terms, a dosage table and tables of weights and measures have been included. A necessary book in every pharmacy student's library.

R. A. L.

Essentials of Prescription Writing by Cary Eggleston, M. D., Associate Professor of Clinical Medicine, Cornell University Medical College. Seventh edition, revised, 1942. 155 pages. W. B. Saunders. Price $1.50.

An excellent little book giving the principles of prescription writing and intended for the instruction of medical students. In the writer's college days, it was amazing how a student could complete a medical course and not know the first principle about writing a prescription. Perhaps a better job is done now. If not, Dr. Eggleston's little book will continue to be a godsend to medical students.

R. A. L.

INSTITUTIONS HOLDING MEMBERSHIP IN THE ASSOCIATION

NEW YORK

University of Buffalo, School of Pharmacy, Buffalo; A. R. Lepley, Dean (1939).

Columbia University, College of Pharmacy of the City of New York, New York; Charles W. Ballard, Dean (1942).

Fordham University, College of Pharmacy, New York; Cheslyn A. Jones, Acting Dean (1939).

Long Island University, Brooklyn College of Pharmacy, Brooklyn; Louis E. Schaefer, Dean (1933).

NORTH CAROLINA

University of North Carolina, School of Pharmacy, Chapel Hill; J. Grover Beard, Dean (1917).

NORTH DAKOTA

North Dakota Agricultural College, School of Pharmacy, Fargo; William P. Sveen, Dean, (1933).

OHIO

Ohio Northern University, College of Pharmacy, Ada; Reddick H. Fenn, Dean (1925).

Ohio State University, College of Pharmacy, Columbus; Bernard V. Christensen, Dean (1909).

University of Toledo, College of Pharmacy, Toledo; Geo. E. Palmer, Dean (1941).

Western Reserve University, School of Pharmacy, Cleveland; Edward D. Davy, Acting Dean (1902).

OKLAHOMA

University of Oklahoma, School of Pharmacy, Norman; David E. E. Johnson, Dean (1906).

OREGON

Oregon State College, School of Pharmacy, Corvallis; Adolph Ziefle, Dean (1915).

PENNSYLVANIA

Duquesne University, School of Pharmacy, Pittsburgh; Hugh C. Muldoon, Dean (1927).

Philadelphia College of Pharmacy and Science, Philadelphia; Ivor Griffith, Dean (1900).

Temple University, School of Pharmacy, Philadelphia; E. Evert Kendig, Dean (1938).

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh; C. Leonard O'Connell, Dean (1906).

PHILIPPINES

University of the Philippines, College of Pharmacy, Manila; Mariano V. del Rosario, Dean (1917).

PUERTO RICO

University of Puerto Rico, College of Pharmacy, Rio Piedras; Luis Torres-Ubeda, Dean (1926).

RHODE ISLAND

Rhode Island College of Pharmacy and Allied Sciences, Providence; W. Henry Rivard, Dean (1934).

SOUTH CAROLINA

Medical College of the State of South Carolina, Charleston; Robert Wilson, Jr. Dean; School of Pharmacy, Washington H. Zeigler, Director (1940).

University of South Carolina, School of Pharmacy, Columbia; Emery T. Motley, Dean (1883).

SOUTH DAKOTA

South Dakota State College, Division of Pharmacy, Brookings; Floyd J. Kalliney, Acting Dean (1900).

TENNESSEE

University of Tennessee, School of Pharmacy, Memphis; Robert L. Crowe, Dean (1914)

TEXAS

University of Texas, College of Pharmacy, Austin; William F. Gidley, Dean (1926).

VIRGINIA

Medical College of Virginia, School of Pharmacy, Richmond; Wortley F. Rudd, Dean (1968).

WASHINGTON

University of Washington, College of Pharmacy, Seattle; Forest J. Goodrich, Dean (1905).

State College of Washington, School of Pharmacy, Pullman; Pearl E. Dimitge, Dean (1912).

WEST VIRGINIA

West Virginia University, College of Pharmacy, Morgantown; J. Lester Harman, Director (1939).

WISCONSIN

University of Wisconsin, School of Pharmacy, Madison; Arthur H. Uhl, Dean (1900).

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Theoretical and Practical
By WALTER H. BLOCK and
CHARLES H. STOCKING. *Cloth,*
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...ed by E. F. KELLY, Ph.G.
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Glenn L. Jenkins, Chairman.